EM370/B

Embedded Single Board Computer
with LCD/SVGA/Sound/Lan & Flash Disk
for Pentium® III / Celeron™
Socket 370 Processor

COPYRIGHT©

This document is a copyright of the original manufacturer, 1999. The original manufacturer reserves the right to make improvements to the product(s) described in this manual at any time without notice. This manual may not, in whole or in part, be photocopied, reproduced, transcribed, translated, or transmitted in whatever form without the written consent of the manufacturer, except for copies retained by the purchaser for backup purposes. All rights are reserved.

TRADEMARKS

Pentium® is a registered trademark of Intel Corporation.

The following are trademarks or registered trademarks of their respective companies: IBM, Intel, AMD, Cyrix, Award, AMI, Microsoft, Windows, Windows NT, Novell, SCO, PC/104, PICMG, ALI, UMC, SMC, Winbond. Products mentioned in this manual are mentioned for identification purposes only. All names of products or services appearing in this manual are the trademarks or registered trademarks of their respective organizations and companies.

© Copyright 2000

Ver. No. 1.2
LEI-UM-EM370-000
Date : 2000/9/19

TABLE OF CONTENTS

CHAPTER 1		**INTRODUCTION**	**1**
	1.1	SPECIFICATION	2
	1.2	PACKING CHECK LIST	3
CHAPTER 2		**JUMPER SETTINGS AND CONNECTORS**	**6**
	2.1	BOARD OUTLINE OF EM370	6
	2.2	JUMPER SETTING OVERVIEW	7
	2.3	INSTALLING THE DIMM MODULE	7
	2.4	JUMPER LOCATION FOR EM370	8
	2.5	JUMPER SETTINGS SUMMARY FOR EM370	9
	2.6	I/O CONNECTORS LOCATION FOR EM370	19
	2.7	I/O CONNECTORS SUMMARY FOR EM370	20
	2.8	I/O CONNECTORS DESCRIPTION	21
CHAPTER 3		**AWARD BIOS SETUP**	**34**
	3.1	RUNNING AWARD BIOS	34
	3.2	CMOS SETUP UTILITY	35
	3.3	STANDARD CMOS SETUP	36
	3.4	BIOS FEATURES SETUP	40
	3.5	CHIPSET FEATURES SETUP	43
	3.6	POWER MANAGEMENT SETUP	47
	3.7	PNP/PCI CONFIGURATION	50
	3.8	LOAD BIOS DEFAULTS	52
	3.9	LOAD SETUP DEFAULTS	52
	3.10	INTEGRATED PERIPHERALS	53
	3.11	SUPERVISOR / USER PASSWORD	55
	3.12	IDE HDD AUTO DETECTION	56
	3.13	HDD LOW LEVEL FORMAT	56
	3.14	SAVE & EXIT SETUP	56
	3.15	EXIT WITHOUT SAVING	56

TABLE OF CONTENTS

CHAPTER 4	DRIVERS SUPPORT	57
APPENDIX A	HOW TO USE WATCH-DOG TIMER	58
APPENDIX B	TECHNICAL REFERENCE	59
APPENDIX C	PC/104 MODULE INSTALLATION	61
GLOSSARY		62
TERMS AND CONDITIONS		68
RMA SERVICE REQUEST FORM		69

CHAPTER 1.

INTRODUCTION

The EM370 is an embedded single board computer with full functionality, LCD/SVGA, LAN, Sound output & a PC/104-plus expansion bus for Intel Pentium III Celeron Processor. It consists of an on-board SVGA & Audio output, a PCI Ethernet Interface and a PC/104 expansion bus. The Intel 440BX establishes a new class of low-cost, high-performance system that offers all the functions of a computer on a single board, and fits in the space of a 5.25-inch floppy drive (only 5.75" x8"). This design eliminates system conflicts and end-user configuration problems.

For the embedded board market this means more memory, more processing might, and more I/O can be packed tighter. The form factor dispenses with the complexity, cost, and bulk of conventional motherboards, backplanes, and card cages. The embedded single board computer in EM370 also comes with the most popular PC/104-plus self –stacking bus connector that suits the small form-factor board standards (compact PC/104-plus 3.6 x 3.8-inch self-stacking, modular format.). Today, the basic PC architecture is used in such diverse embedded applications as vending machines, communications devices, portable systems, and medical equipment. Among PC/104-plus standardizes the repackaging of desktop PC functions to satisfy the ruggedness, reliability, and size constraints of embedded systems. PC/104-plus lets you combine special-purpose embedded functions with the basic PC computing core.

Other on-board features include four serial ports (RS-232 and RS-232/422/485), one multi-mode parallel (ECP/EPP/SPP) port, a floppy drive controller and a keyboard interface and a PS/2 mouse interface. The built-in high speed PCI IDE controller supports both PIO and bus master modes. Up to two IDE devices can be connected, including large hard disks, CD-ROM drives, tape backup drives and other IDE devices. Its 6-layer printed circuit board combines with noise-tolerant and low power consumption CMOS technology applied on the board makes EM370 able to withstand any harsh environments very well.

1.1 SPECIFICATIONS

- Processor : Support Intel Pentium III Celeron Processors in the PPGA (Plastic Pin Grid Array) and FCPGA (Flip Chip Pin Grid Array)
- Chipset : Intel 440BX chipsets, CHIPS 69000, Realtek 8139, ESS 1938 sound chip, Winbond 977EF & 877TF I/O compatible chips, Winbond W83783S
- System Memory : One 168-pin DIMM socket that support up 256MB of SDRAM / EDO DRAM
- BIOS : 256KB Licensed Award Flash BIOS
- Flash Memory Disk : Reserved socket for DiskOnChip from M-System, support up to 144 MB flash memory Disk
- VGA/LCD Controller : C&T 69000 LCD/CRT chipset on-die 2MB video memory
- Ethernet Controller : On-board Realtek 8139, support 100 BASE-TX
- Sound Output : On-board ESS 1938 PCI interface
- IDE Drive Interface : TWO PCI IDE ports, support up to four IDE devices Ultra DMA/33
- Floppy Drive Interface : One FDD port, support up to two floppy devices
- Serial Port : Four COM ports for three RS-232 and one selectable RS-232/422/485
- Parallel Port : Two multi-mode parallel port (EPP/ECP/SPP)
- RTC Battery : Dallas RTC battery or compatible
- DMA : 8 DMA channels
- Interrupts : 16 levels of hardware interrupts
- External Power Connector : On-board 7-pin & 4-pin external power connector
- PC/104-Plus Expansion Bus :
  Built-in PC/104-Plus expansion Bus
- Watchdog Timer : 16 level time-out intervals by software program
- Universal Serial Bus : Support two USB ports
- IR Interface : Supports one IrDA header
- Health Monitoring : On-board Winbond W83783S
- Operating Temperature : 0°C~60°C
- Humidity : 10%~90% RH
- Dimensions : 203 mm X 146 mm (8" X $5^3/_4$" inches)
- Net weight : 350 g (0.770 pounds)
- GPS Interface : Reserved Header for GPS Kit

Notice :

1.Version below 2.0 only supports Intel Celeron in the PPGA (Plastic Pin Grid Array) Package, and one parallel port

2.EM370B support:

- VGA/LCD Controller : C&T 69030 LCD/CRT chipset on-die 4MB video memory

1.2 PACKING CHECK LIST

Before you begin to install your card, please make sure that you received the following materials as listed below:

- **Standard Packing：**

Item	*Qty*	*Remark*
❶EM370 Embedded Single Board Computer	1 pc.	EM370 SBC
❷VGA/Audio/Lan/h-monitor Drivers	1 pc.	Drivers of CD-ROM
❸User‘ s manual	1 pc.	EM370 manual

Note：All Option Kits are to be purchased separately

- **Option (1)： EM370CB**

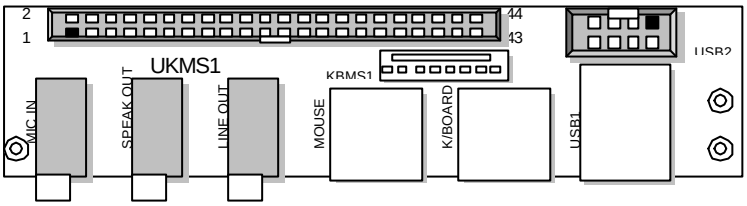
Item	*Qty*	*Remark*
❶EIDE cable	1 pc.	44-pin narrow header to 40-pin standard header
❷Floppy cable	1 pc.	34-pin standard header to 34-pin etch connector
❸Printer port cable	1 pc.	26-pin standard header to 25-pin female D-Sub (Attached to standard I/O card bracket)
❹CRT-2 cable	1 pc.	12-pin standard header to 15-pin/3-rows D-Sub
❺Game port cable	1 pc.	16-pin standard header to 15-pin/2-rows D-Sub
❻EBX Power Transfer Cable	1 pc	7-pin+4-pin to P8/P9 12 pin Power Transfer Cable
❼PC/104-plus Mounting kit	1 set	4×brass spacer (25mm) 4×null 4×screws (M3×6)

Note：Option (1) is usable by version below 2.0

● Option (2)： EMUKMS-02 kit

Item	*Qty*	*Remark*
❶EMUKMS-02 (USB/Keyboard/Mouse/Sound cabled kit)	1 set	1× 44-pin to 44-pin thin flat ribbon female cable 1× U-K-M-S board 92.92×27.00 mm (with 3×Sound phone jack, 1×6-pin PS/2 Keyboard connector, 1×6-pin PS/2 Mouse and 2 x USB connector)
❷Keyboard adapter cable	1 set	6-pin header to 5-pin AT keyboard connector

EMUKMS-02 Kit Top View ：

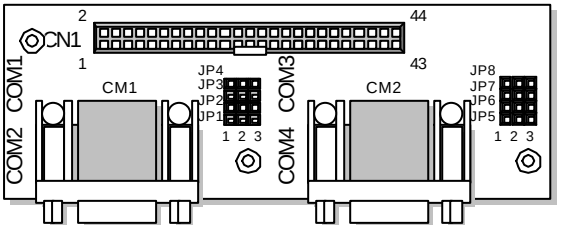


● Option (3)： EMCOM-01 or EMCOM-02 kit

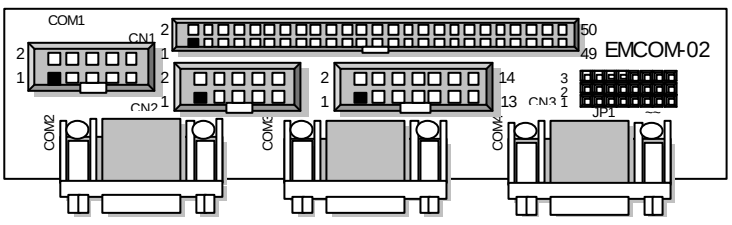
Item	*Qty*	*Remark*
❶EMCOM-01 (COM cabled kit)	1 set	1× 50-pin to 44-pin thin flat ribbon female cable 1× Four COM port board 90.00×30.00 mm (with 4×9-pin COM port female D-sub connector)

Item	*Qty*	*Remark*
❶EMCOM-02 (COM cabled kit)	1 set	1× 50-pin to 50-pin thin flat ribbon female cable 1× Four COM port board 111.58×30.00 mm (with 3×9-pin COM port female D-sub connector, and 1X10-pin COM port standard header)

EMCOM-01 Kit Top View ：



EMCOM-02 Kit Top View ：



- **Option (4)： LCD Adapter Kit：[for example：LK-XXX (XXX=001,002,….)]**

Item	*Qty*	*Remark*
❶LCD Adapter	1 pc.	Please check LCD adapter list user' s manual
❷LCD adapter list user' s manual	1 pc.	LCD adapter list manual
❸LCD/Flat-Panel adapter cable (An Option Kit, please check your requirement with the LCD Adapter List)	1 set	Please check LCD adapter list user' s manual

- **Option (5)： EM370CB V2.0**

Item	*Qty*	*Remark*
❶EIDE cable	1 pc.	44-pin narrow header to 40-pin standard header
❷Floppy cable	1 pc.	34-pin standard header to 34-pin etch connector
❸Printer port cable	1 pc.	26-pin standard header to 25-pin female D-Sub (Attached to standard I/O card bracket)
❹CRT-2 cable	1 pc.	12-pin standard header to 15-pin/3-rows D-Sub
❺Game port cable	1 pc.	16-pin standard header to 15-pin/2-rows D-Sub
❻EBX Power Transfer Cable	1 pc	7-pin+4-pin to P8/P9 12 pin Power Transfer Cable
❼PC/104-plus Mounting kit	1 set	4×brass spacer (25mm) 4×null 4×screws (M3×6)
❼Parallel Port Cable	1 pc.	26-pin box header to 25-pin D-sub with bracket

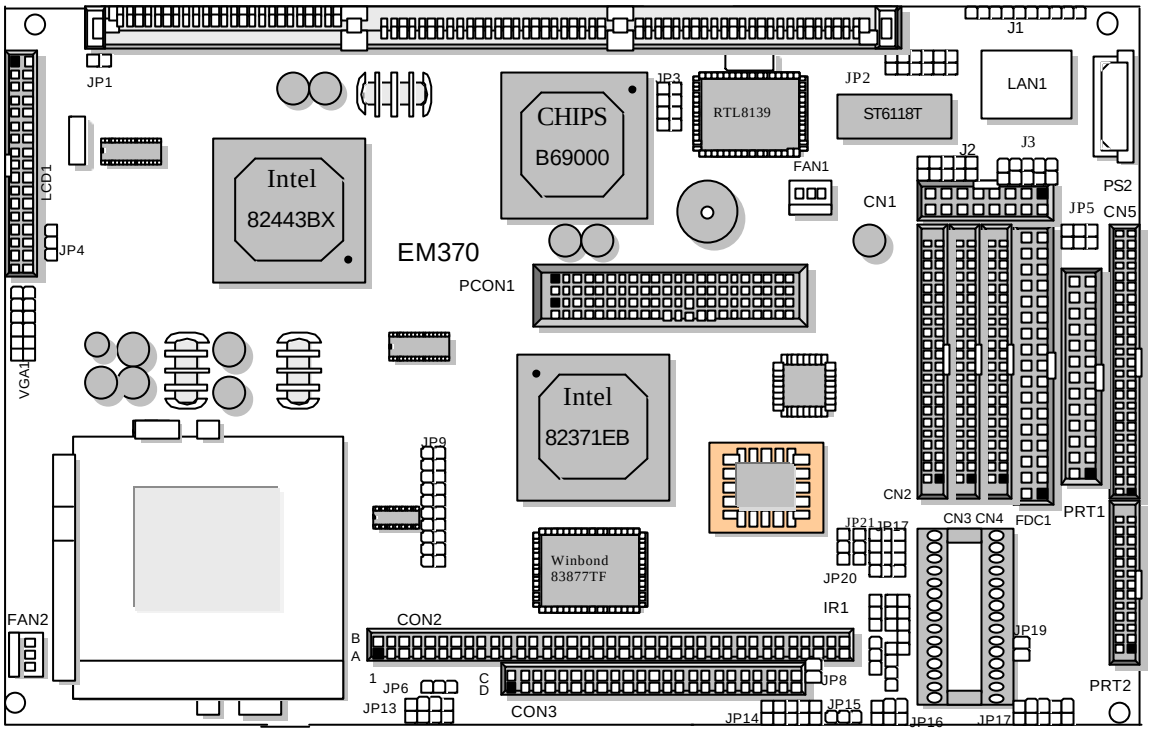
Note：Option (5) is not usable by version below 2.0

CHAPTER 2.

JUMPER SETTINGS AND CONNECTORS

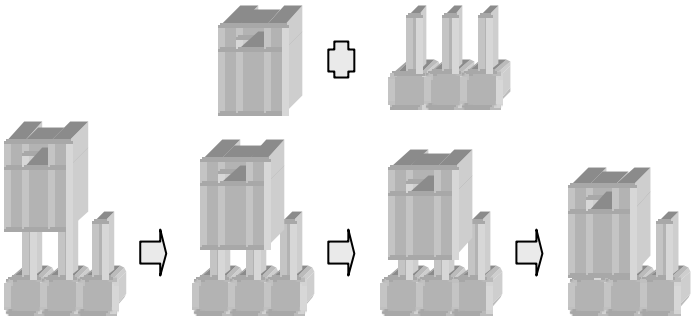
The figure below shows the jumpers and connectors location on the EM370:

2.1 BOARD OUTLINE OF EM370



2.2 JUMPER SETTING OVERVIEW

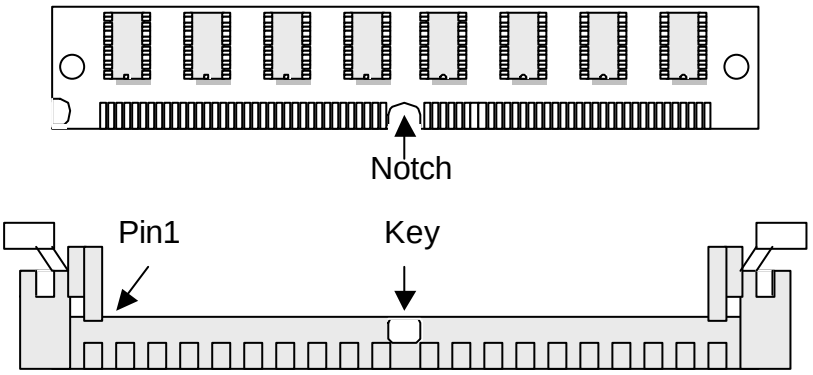
In order to select the operation modes of your system, configure and set the jumpers on the your Embedded SBC to match the need of your application. To set a jumper, a black plastic cap containing metal contacts is placed over the jumper pins as designated by the required configuration as listed in this section. A jumper is said to be " on " or " 1-2 " when the black cap has been placed on two of its pins, as show in the figure below:



A pair of needle-nose pliers is recommended when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local sales representative before you make any changes. In general, you simply need a standard cable to make most connections.

2.3 INSTALLING THE DIMM MODULE:

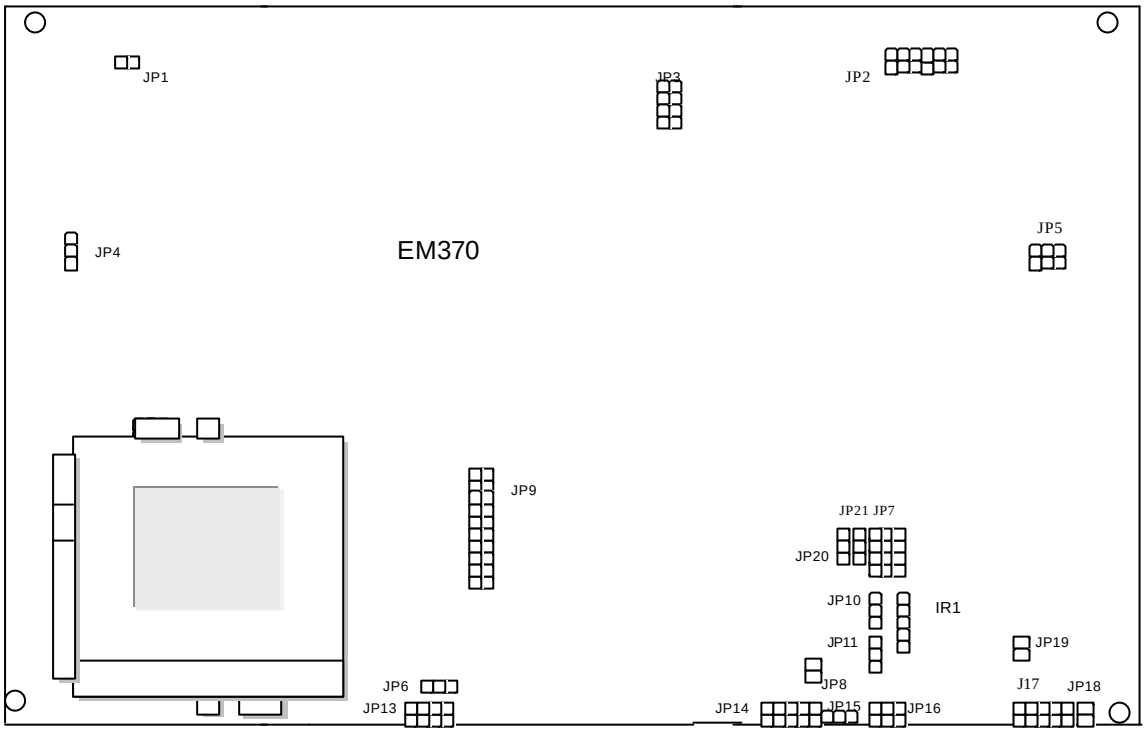
A DIMM module simply snaps into a socket on the system board. Pin1 of the DIMM module must correspond with Pin1 of the socket.



1.Position the DIMM above the socket with the "notch" in the module aligned with the "key" on the socket.

2. Seat the module at a 90 angle into the bank. Make sure it is completely seated. Tilt the module upright until it locks in place in the socket.

2.4 JUMPER LOCATION FOR EM370



2.5 JUMPER SETTINGS SUMMARY FOR EM370

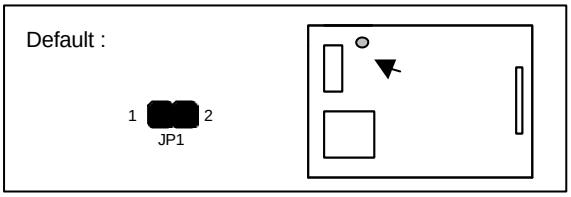
LOCATION	FUNCTION
JP1	Select CPU External Bus Clock
JP2	Select LAN LED & Sound Switch
JP3	Select Panel Type
JP4	Select Panel Voltage
JP5	Select COM2 Type
JP6	Manufacture Setting
JP7	Select Enable / Disable COM2
JP8	Manufacture Setting (For Debug)
JP9	GPS Connector
JP10	Select ISP GAL Function (Manufacture Define)
JP11	Select ISP GAL Function (Manufacture Define)
JP13	Select Internal CPU Clock Ratio
JP14	Digital Input / Digital Output Ports
JP15	Clear COMS (Power-On Situation)
JP16	Select M-System or SRAM Type
JP17	Select M-System Address and SRAM Address
JP19	Select M-System or SRAM Type
JP20	Select M-System or SRAM Type
JP21	Select M-System or SRAM Type
EMCOM-01 JP5~JP8	Select COM4 Type (EMCOM-01 JP1~JP4 Manufacturer Setting)
EMCOM-02 JP1~JP8	Select COM4 Type (EMCOM-02 JP1~JP8 Manufacturer Setting)

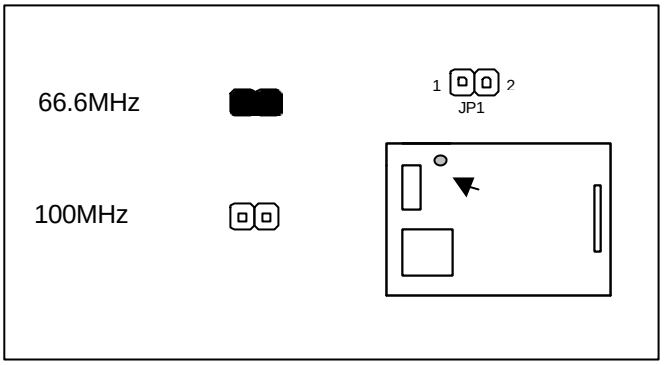
Note : The following jumpers are different of version below v2.0

LOCATION	FUNCTION
JP15	Manufacture Setting (For NC Battery)
JP18	Clear CMOS (Power-On situation)

- **JP1 : Select CPU External Bus Clock**

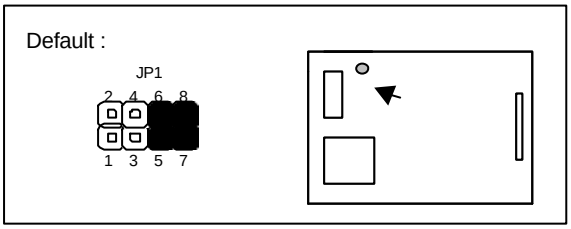
CPU External Bus Clock	JP1
66.6 MHz (Default)	ON
100MHz	OFF

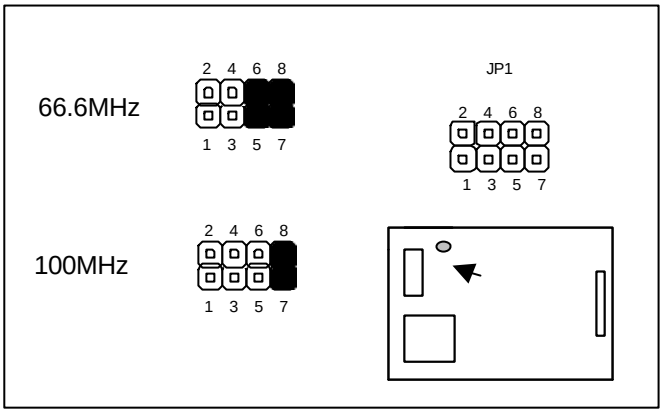




- **JP1 (For version below 2.0): Select CPU External Bus Clock**

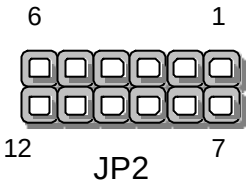
CPU External Bus Clock	JP1
66.6 MHz (Default)	5-6,7-8
100MHz	7-8





- **JP2 : LAN LED & Sound Switch**

JP2 Connector	Description
Pin 1 & Pin 7 of JP2	10M LED
Pin 2 & Pin 8 of JP2	RX-TX ACT LED
Pin 3 & Pin 9 of JP2	100M LED
Pin 5 & Pin 11 of JP2	VOL+ SW
Pin 6 & Pin 12 of JP2	VOL- SW



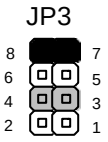
JP2 Pin No.	Signal	JP2 Pin No.	Signal
1	10M	7	VCC
2	RX-TX	8	VCC
3	100M	9	VCC
4	Ground	10	NC
5	Ground	11	VOL+
6	Ground	12	VOL-

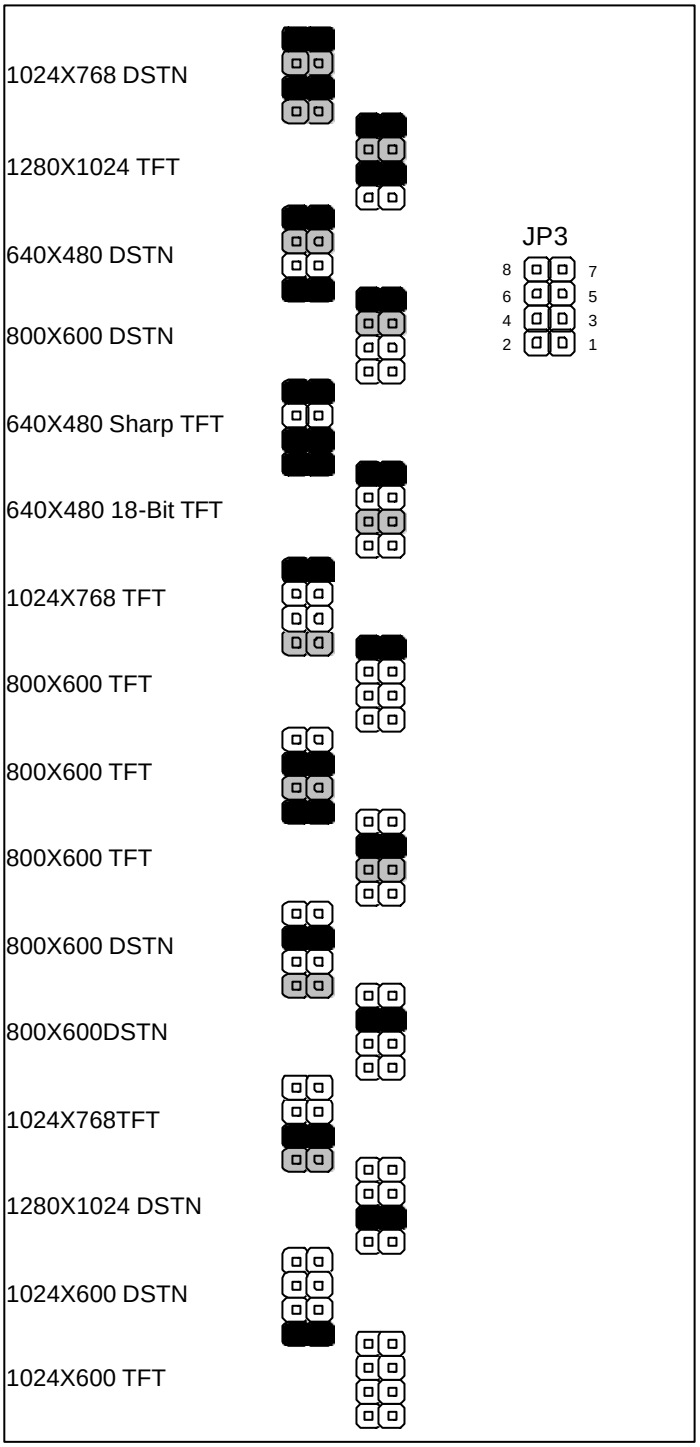
- **JP3 : Select Panel Type**

Panel Type	JP3
1024 X 768 DSTN	1-2,3-4,5-6,7-8
1280 X 1024 TFT	3-4,5-6,7-8
640 X 480 DSTN	1-2,5-6,7-8
800 X 600 DSTN	5-6,7-8
640 X 480 Sharp TFT	1-2,3-4,7-8
640 X 480 18-Bit TFT	3-4,7-8
1024 X 768 TFT	1-2,7-8
800 X 600 TFT	7-8
800 X 600 TFT	1-2,3-4,5-6
800 X 600TFT	3-4,5-6
800 X 600 DSTN	1-2,5-6
800 X 600 DSTN	5-6
1024 X 768 TFT	1-2,3-4
1280 X 1024 DSTN	3-4
1024 X 600 DSTN	1-2
1024 X 600 TFT	OFF

Note: Different type of LCD panel with the same resolution will have different jumper setting for selection.

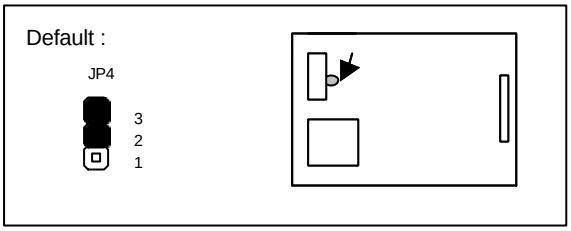
Default :

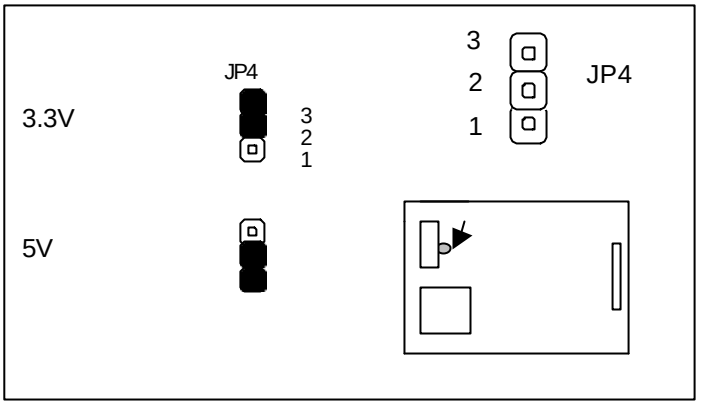




● JP4 : Select Panel Voltage

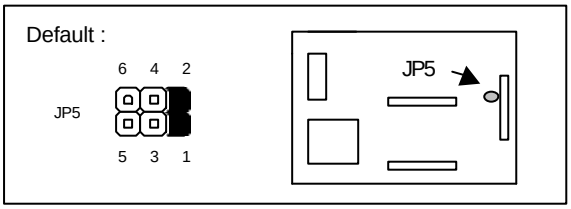
Panel Voltage	JP4
3.3V (Default)	2-3
5V	1-2

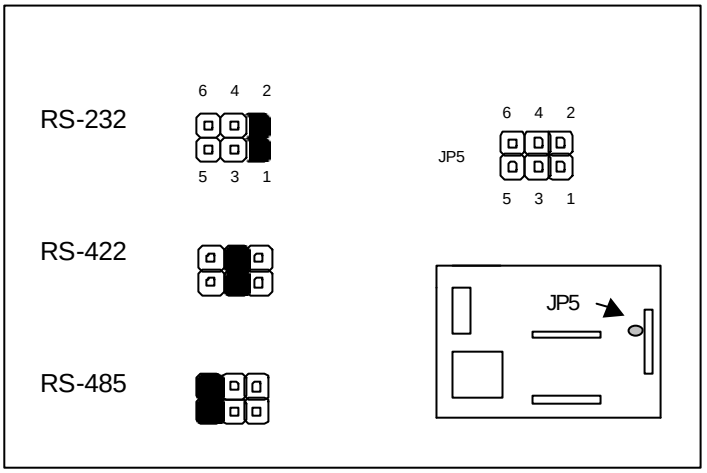




● JP5 : Select COM2 Type

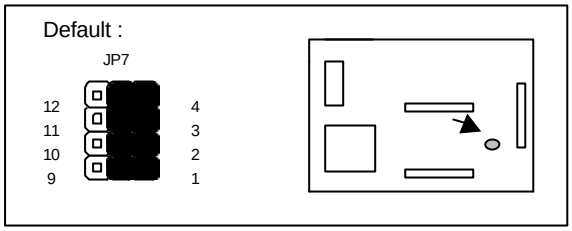
COM2 Type	JP5
RS-232 (Default)	1-2
RS-422	3-4
RS-485	5-6

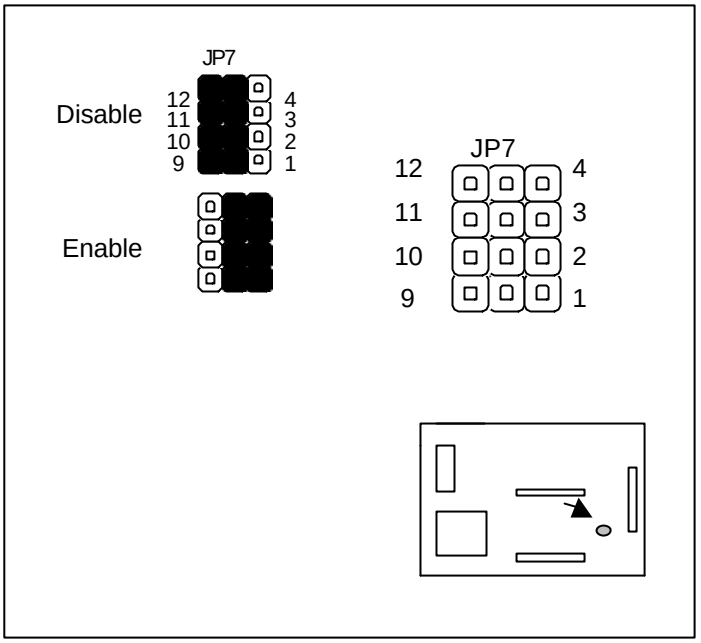




- **JP7 : Select Disable or Enable COM2**

Disable/Enable COM2	JP7
Disable (For GPS)	5-9,6-10, 7-11,8-12
Enable (Default)	1-5,2-6,3-7,4-8



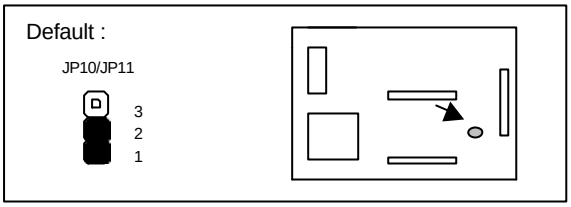


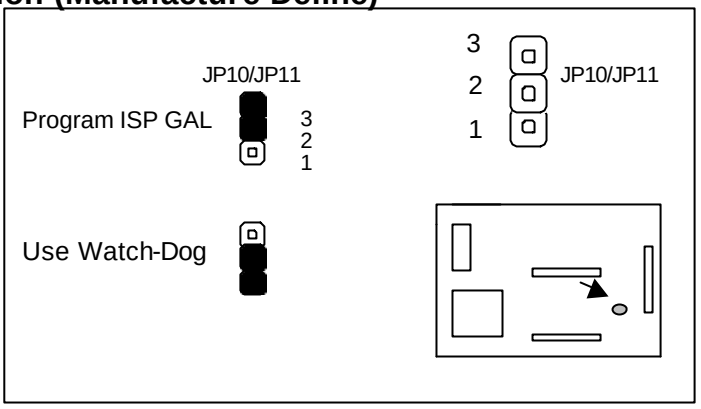
- **JP9 : GPS Connector**

Pin No.	Description	Pin No.	Description
1	VCC	2	VCC
3	NC	4	NC
5	RESET	6	NC
7	NC	8	NC
9	NC	10	GND
11	RX	12	TX
13	GND	14	NC
15	NC	16	GND
17	GND	18	GND
19	NC	20	NC

● JP10/JP11 : Select ISP GAL Function (Manufacture Define)

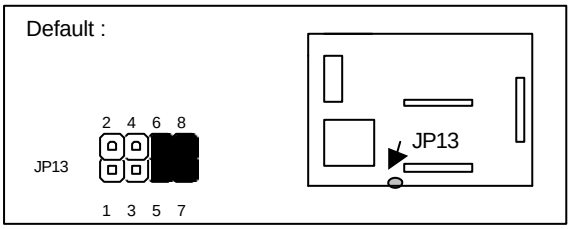
	JP10	JP11
Program ISP GAL	2-3	2-3
Use Watch-Dog	1-2	1-2

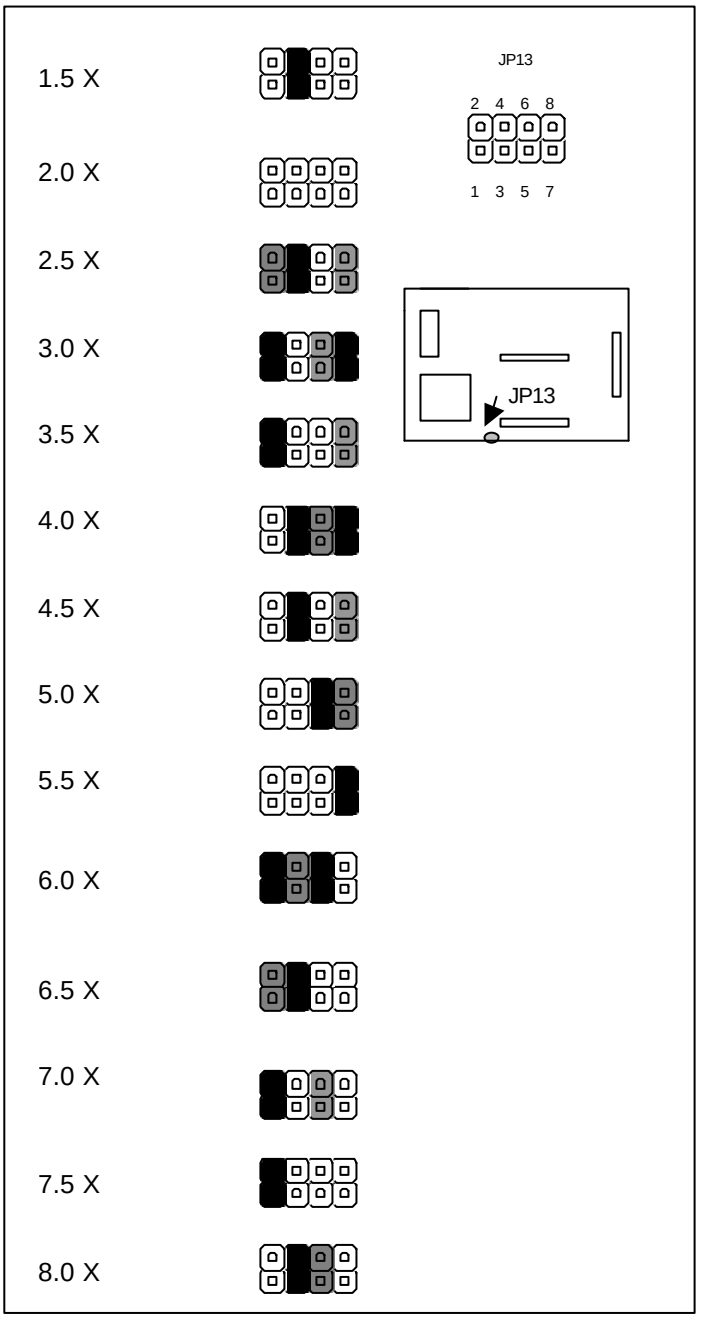




● JP13 : Select Internal CPU Clock Ratio

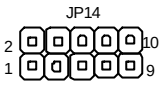
Internal CPU Clock Ratio	JP13
1.5 X	3-4
2.0 X	OFF
2.5 X	1-2,3-4,7-8
3.0 X	1-2,5-6,7-8
3.5 X	1-2,7-8
4.0 X	3-4,5-6,7-8
4.5 X	3-4,7-8
5.0 X (Default)	5-6,7-8
5.5 X	7-8
6.0X	1-2,3-4,5-6
6.5X	1-2,3-4
7.0X	1-2,5-6
7.5X	1-2
8.0X	3-4,5-6

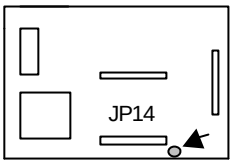




- **JP14 : Digital Input / Digital Output Ports (Header)**

Pin No.	Description	Pin No.	Description
1	IN0	2	OUT0
3	IN1	4	OUT1
5	IN2	6	OUT2
7	IN3	8	OUT3
9	Ground	10	Ground

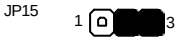


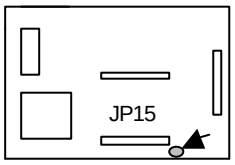


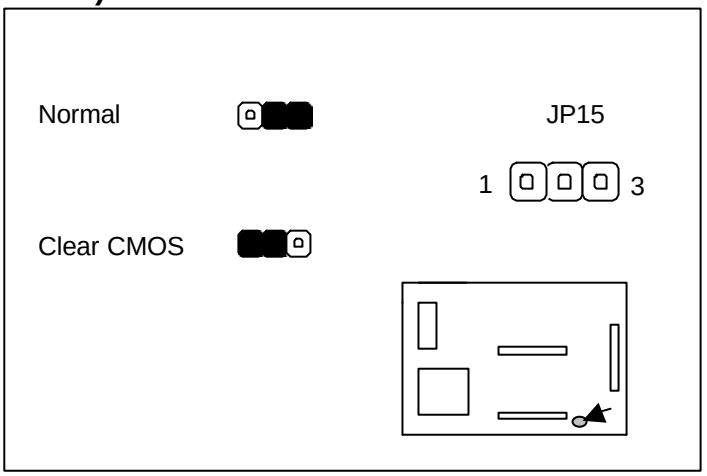
- **JP15 : Clear CMOS (Power-On Situation)**

Clear CMOS Jumper	JP15
Normal	2-3
Clear CMOS	1-2

Default :



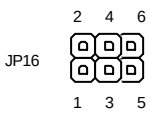


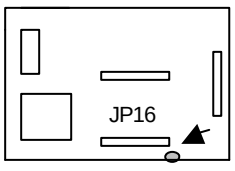


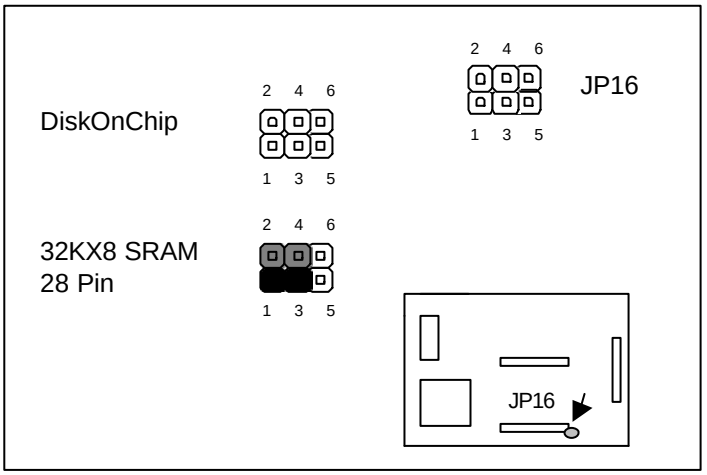
- **JP16 : Select M-System or SRAM Type**

Select Type	JP16
DiskOnChip	OFF
32K X 8 SRAM 28 Pin	1-3,2-4

Default :

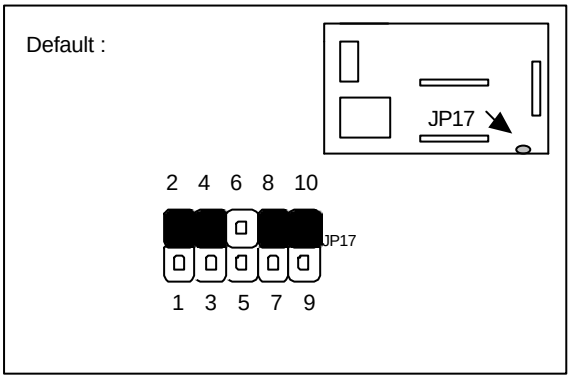


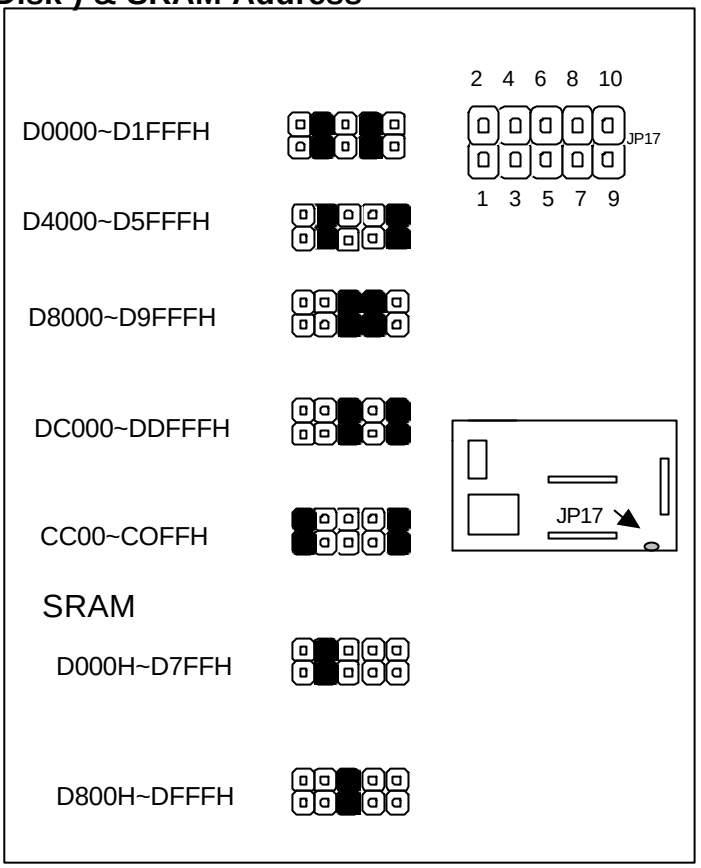




● JP17 : Select DiskOnChip (Flash Disk) & SRAM Address

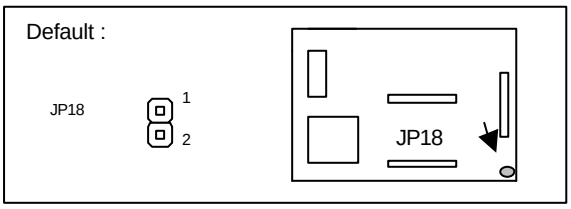
Flash Disk Address	JP17
D0000~D1FFFH	3-4,7-8
D4000~D5FFFH	3-4,9-10
D8000~D9FFFH	5-6,7-8
DC000~DDFFFH	5-6,9-10
CC00~COFFH	1-2,9-10
SRAM Adress	**JP17**
D000H~D7FFH	3-4
D800H~DFFFH	5-6

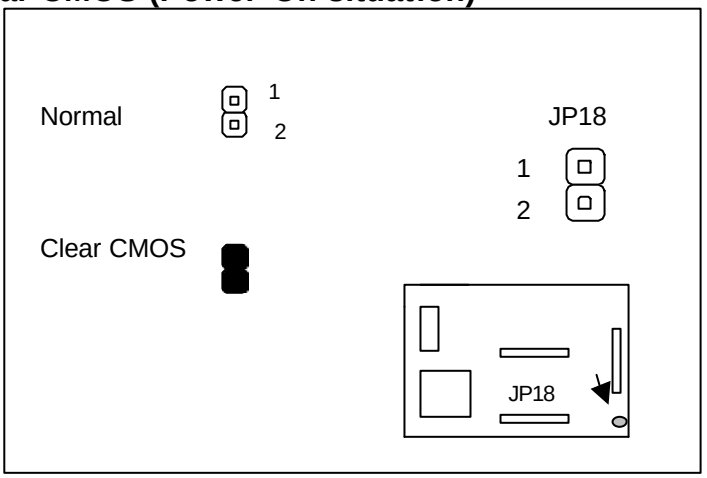




● JP18 (For version below 2.0) : Clear CMOS (Power-On situation)

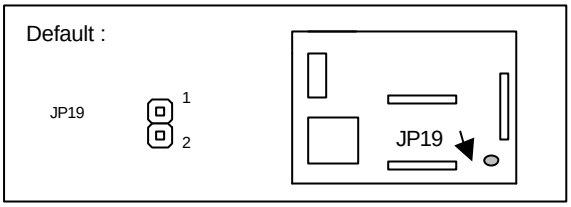
Clear CMOS Jumper	JP18
Normal	OFF
Clear CMOS	1-2

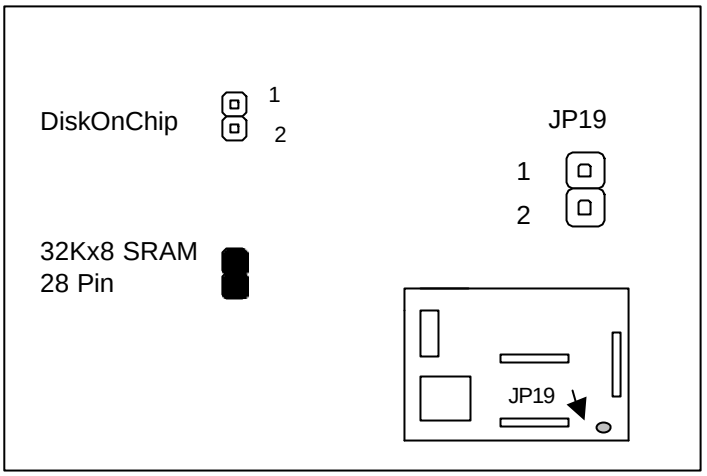




JP19 : Select M-System or SRAM Type

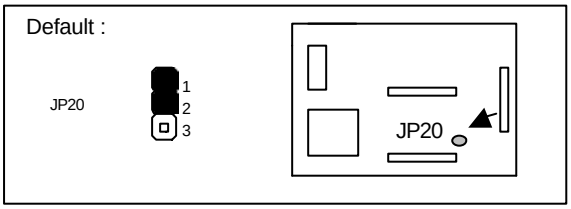
Select Type	JP19
DISKOnChip	OFF
32K X 8 SRAM 28 Pin	1-2

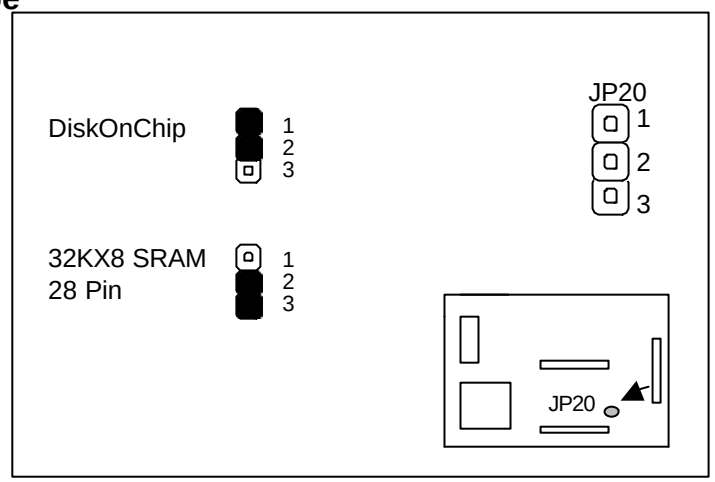




JP20 : Select M-System or SRAM Type

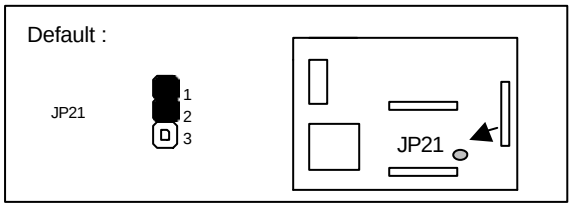
Select Type	JP20
DiskOnChip	1-2
32K X 8 SRAM 28 Pin	2-3

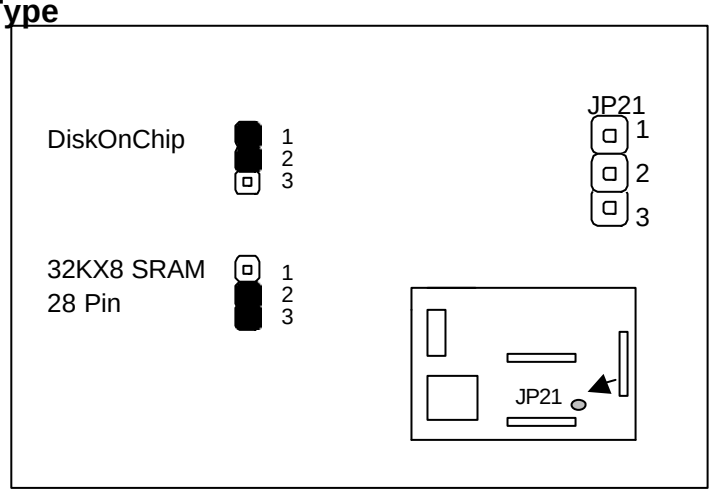




● JP21 : Select M-System or SRAM Type

Select Type	JP21
DiskOnChip	1-2
32K X 8 SRAM 28 Pin	2-3



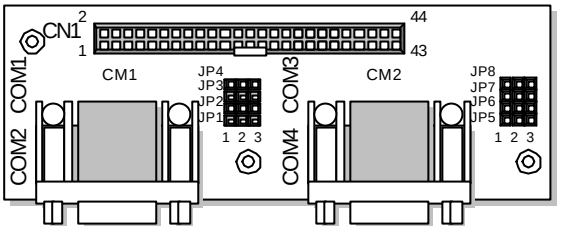


- **EMCOM-01 Jumper Setting：**

1. JP1~JP4：Manufacturer Setting
2. JP5~JP8：Select COM4 Type

COM4 Type	JP5	JP6	JP7	JP8
RS-232 (Default)	1-2	1-2	1-2	1-2
RS-422	2-3	2-3	2-3	2-3
RS-485	2-3	2-3	2-3	2-3

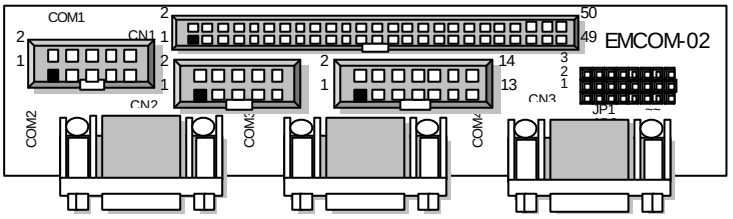
EMCOM-01 Kit Top View ：



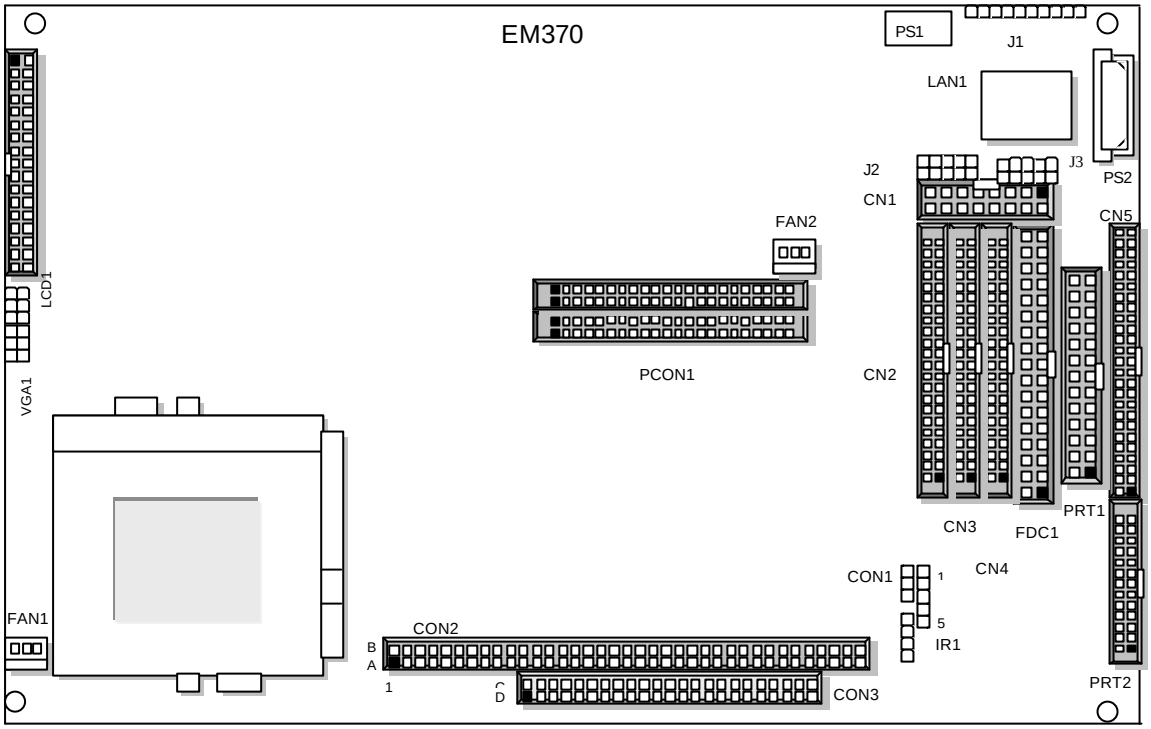
- **EMCOM-02 Jumper Setting：**

1. JP1~JP8：Manufacturer Setting

EMCOM-02 Kit Top View ：



2.6 I/O Connector Location for EM370



2.7 I/O Connector Summary of EM370

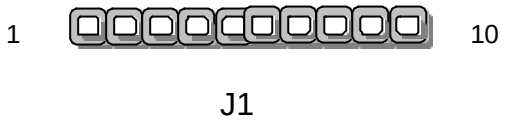
LOCATION	FUNCTION
J1	Reset SW, LED & Speaker
J2	LAN Connector (Header)
J3	Reset SW, LED & Speaker
IR1	Alternate IrDA
FAN1	FAN1 Connector
FAN2	FAN2 Connector
PS1	-5V&-12V Power Connector
PS2	EBX Power Connector
CN5	COM1~COM4 Connector (Header)
CN2	CD_IN, MIC_IN, LIN_IN, Mouse, Keyboard, USB1, USB2 Connector
LCD1	Panel LCD Connector (Header)
FDC1	Floppy Interface Connector (Header)
PRT1	Parallel #1 Port Connector (Header)
PRT2	Parallel #2 Port Connector (Header)
CN3,CN4	EIDE Interface Connector (Header)
VGA1	External VGA Connector (Header)
LAN1	LAN Connector (RJ45)
CN1	GAME Port Connector (Header)
CON2、CON3	PC/104 Connector
PCON1	PC/104-Plus Connector
CON1	Manufacturer Setting (For Pre-Load Watch-Dog on Factory)

Note:PRT2 (Parallel #2 Port Connector) are not available of version below v2.0

2.8 I/O CONNECTORS DESCRIPTION

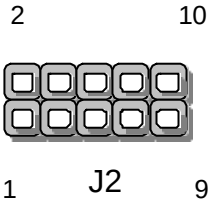
- **J1 : Reset SW, LED & Speaker**

J4 Connector	Description
Pin 1 ~ Pin 2 of J1	Power LED
Pin 3 ~ Pin 4 of J1	HDD LED
Pin 5 ~ Pin 6 of J1	Reset SW
Pin 7 ~ Pin 8 of J1	Used Internal Buzzer
Pin 7 ~ Pin 10 of J1	External Speaker



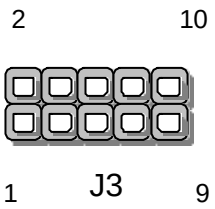
- **J2 : LAN Connector (Header)**

Pin No.	Description
1	TX+
2	TX-
3	RX+
4	T78
5	T78
6	RX-
7	T45
8	T45
9	LGND
10	LGND



- **J3 : Reset SW, LED & Speaker**

J4 Connector	Description
Pin 1 ~ Pin 2 of J3	Power LED
Pin 3 ~ Pin 4 of J3	HDD LED
Pin 5 ~ Pin 6 of J3	Reset SW
Pin 7 ~ Pin 8 of J3	Used Internal Buzzer
Pin 7 ~ Pin 10 of J3	External Speaker



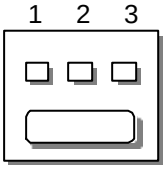
- **IR1 : Alternate IrDa**

Pin No.	Description
1	VCC
2	FIRRX
3	IRRX
4	GND
5	IRTX

IR1

- **FAN1 : FAN1 Connector**

Pin No.	Description
1	Ground
2	+12V
3	FAN Status



FAN1

- **FAN2 : FAN2 Connector**

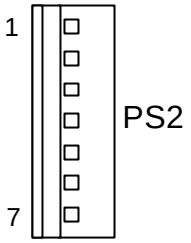
Pin No.	Description
1	Ground
2	+12V
3	FAN Status

- **PS1 : -5V & -12V Power Connector**

Pin No.	PS1
1	GND
2	-5V
3	GND
4	-12V

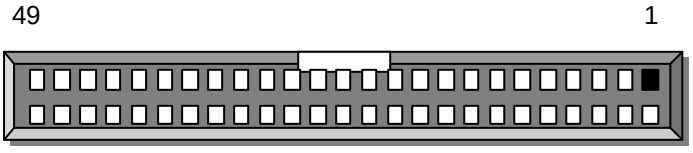
- **PS2 : EBX Power Connector**

Pin No.	PS1
1	+5V
2	GND
3	GND
4	+12V
5	NC
6	GND
7	+5V



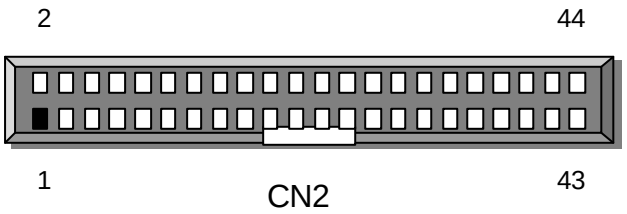
- **CN5 : COM1 ~ COM4 Connector**

Pin No.	Description	Pin No.	Description
1	DCD1#	2	DSR1#
3	SIN1	4	RTS1#
5	SOUT1#	6	CTS1#
7	DTR1#	8	RI1#
9	COMGND	10	COMGND
11	DCD4#	12	DSR4#
13	SIN4	14	RTS4#
15	SOUT4#	16	CTS4#
17	DTR4#	18	RI4#
19	COMGND	20	COMGND
21	DCD3#	22	DSR3#
23	SIN3	24	RTS3#
25	SOUT3#	26	CTS3#
27	DTR3#	28	RI3#
29	COMGND	30	COMGND
31	NC	32	NC
33	NC	34	NC
35	COMGND	36	COMGND
37	DCD2#	38	DSR2#
39	SIN2	40	RTS2#
41	SOUT2#	42	CTS2#
43	DTR2#	44	RI2#
45	COMGND	46	COMGND
47	485TXD+	48	485TXD-
49	485RXD+	50	485RXD-



- **CN2 : CD_IN, MIC_IN, LIN_IN, Mouse, Keyboard, USB1, USB2 Connector**

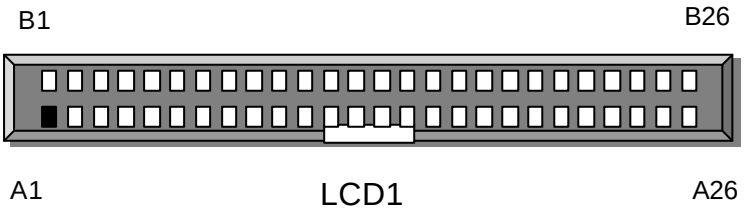
Pin No.	Description	Pin No.	Description
1	R-CDI	2	AGND1
3	L-CDI	4	AGND1
5	MIC-IN	6	AGND1
7	AGND1	8	LINER
9	LIN-L	10	AGND1
11	LINEL	12	LIN-R
13	AGND1	14	AGND1
15	AGND1	16	HO-L
17	AGND1	18	AGND1
19	HO-R	20	AGND1
21	AGND1	22	LO-R
23	AGND1	24	AGND1
25	LO-L	26	AGND1
27	KB_GND	28	VCCF
29	MSDATA	30	MSCLK
31	KB_GND	32	VCCF
33	KBDATA	34	KBCLK
35	Ground	36	Ground
37	VUSB1	38	VUSB2
39	USB1-	40	USB2-
41	USB1+	42	USB2+
43	USGND	44	USGND



CN2

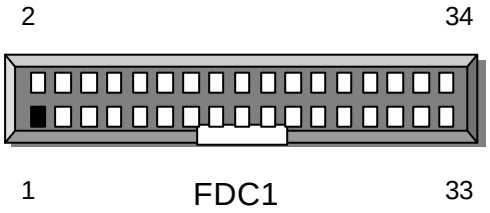
- **LCD1 : Panel LCD Connector (Header)**

PIN	SIGNAL	PIN	SIGNAL
A1	P0	B1	P15
A2	P1	B2	P31
A3	P2	B3	P16
A4	P24	B4	P17
A5	P3	B5	P18
A6	P4	B6	P32
A7	P25	B7	GND
A8	GND	B8	SCLK
A9	P5	B9	GND
A10	P6	B10	DE
A11	P26	B11	FLM
A12	P7	B12	LP
A13	P8	B13	GND
A14	GND	B14	P19
A15	P27	B15	P20
A16	P9	B16	GND
A17	P10	B17	P21
A18	P28	B18	P22
A19	P11	B19	P33
A20	GND	B20	P23
A21	P12	B21	P34
A22	P29	B22	ENBKL
A23	P13	B23	P35
A24	P30	B24	ENAVEE
A25	P14	B25	VCC
A26	ENAVEE	B26	VCC



- **FDC1 : Floppy Interface Connector (Header)**

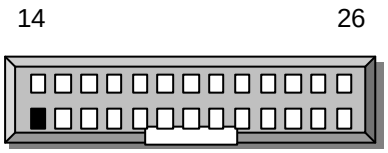
Pin No.	Description	Pin No.	Description
1	Ground	2	Density Select
3	Ground	4	NC
5	Ground	6	DS1
7	Ground	8	Index #
9	Ground	10	Motor Enable A #
11	Ground	12	Drive Select B #
13	Ground	14	Drive Select A #
15	Ground	16	Motor Enable B #
17	Ground	18	Direction #
19	Ground	20	Step #
21	Ground	22	Write Data #
23	Ground	24	Write Gate #
25	Ground	26	Track 0 #
27	Ground	28	Write Protect #
29	NC	30	Read Data #
31	Ground	32	Head Side Select #
33	NC	34	Disk Change #



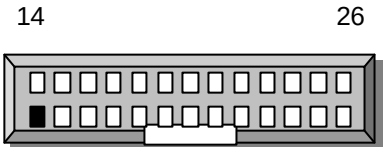
FDC1

- **PRT1 : Parallel #1 Port Connector (Header)**

Pin No.	Description	Pin No.	Description
1	Strobe #	14	Ground
2	Auto Form Feed #	15	Data 6
3	Data 0	16	Ground
4	Error #	17	Data 7
5	Data 1	18	Ground
6	Initialize #	19	Acknowledge #
7	Data 2	20	Ground
8	Printer Select IN #	21	Busy
9	Data 3	22	Ground
10	Ground	23	Paper Empty
11	Data 4	24	Ground
12	Ground	25	Printer Select
13	Data 5	26	Ground



PRT1



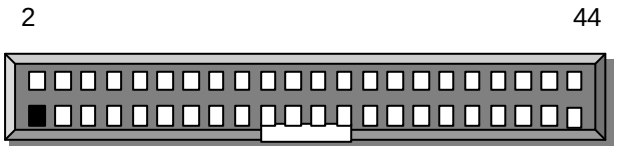
PRT2

- **PRT1 : Parallel #2 Port Connector (Header)**

Pin No.	Description	Pin No.	Description
1	Strobe #	14	Ground
2	Auto Form Feed #	15	Data 6
3	Data 0	16	Ground
4	Error #	17	Data 7
5	Data 1	18	Ground
6	Initialize #	19	Acknowledge #
7	Data 2	20	Ground
8	Printer Select IN #	21	Busy
9	Data 3	22	Ground
10	Ground	23	Paper Empty
11	Data 4	24	Ground
12	Ground	25	Printer Select
13	Data 5	26	Ground

- **CN3,CN4 : IDE Interface Connector (Header)**

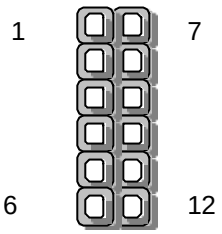
Pin No.	Description	Pin No.	Description
1	Reset #	2	Ground
3	Data 7	4	Data 8
5	Data 6	6	Data 9
7	Data 5	8	Data 10
9	Data 4	10	Data 11
11	Data 3	12	Data 12
13	Data 2	14	Data 13
15	Data 1	16	Data 14
17	Data 0	18	Data 15
19	Ground	20	NC
21	DMA REQ #	22	Ground
23	IOW #	24	Ground
25	IOR #	26	Ground
27	IOCHRDY	28	Ground
29	DMA ACK #	30	Ground
31	Interrupt	32	NC
33	SA 1	34	NC
35	SA 0	36	SA 2
37	HDC CS 0#	38	HDC CS 1#
39	HDD Active	40	Ground
41	VCC	42	VCC
43	Ground	44	NC



CN3,CN4

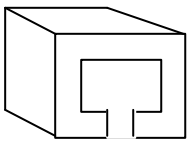
- **VGA1 : External VGA Connector (Header)**

Pin No.	Description	Pin No.	Description
1	R	7	Ground
2	G	8	Ground
3	B	9	Ground
4	H-SYNC	10	Ground
5	V-SYNC	11	Ground
6	DDDA	12	DDCK



- **LAN1 : LAN Connector (RJ-45)**

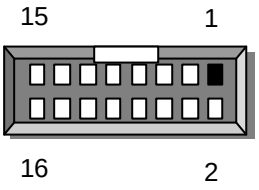
Pin No.	Description
1	TX+
2	TX-
3	RX+
4	T78
5	T78
6	RX-
7	T45
8	T45



LAN1

- **CN1 : GAME Port Connector (Header)**

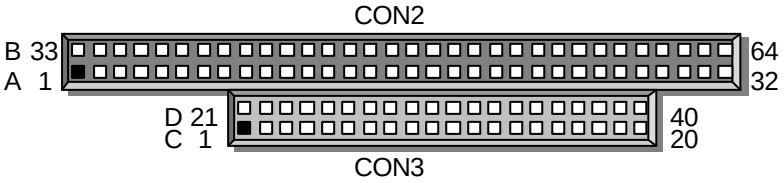
Pin No.	Description	Pin No.	Description
1	VCC	2	VCC
3	SWA	4	SWC
5	OA	6	OC
7	Ground	8	MIDI_OUT
9	Ground	10	OD
11	OB	12	SWD
13	SWB	14	MIDI_IN
15	VCC	16	Ground



CN1

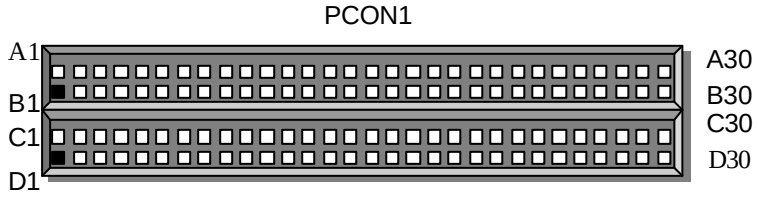
- **CON2 , CON3 : PC/104 Connector**

Pin No.	Description			
	CON2		CON3	
	Row A	Row B	Row C	Row D
1	IOCHCK#	Ground	Ground	Ground
2	SD7	RSTDRV	SBHE#	MEMCS16#
3	SD6	+5V	LA23	IOCS16#
4	SD5	IRQ9	LA22	IRQ10
5	SD4	-5V	LA21	IRQ11
6	SD3	DRQ2	LA20	IRQ12
7	SD2	-12V	LA19	IRQ15
8	SD1	0 WS#	LA18	IRQ14
9	SD0	+12V	LA17	DACK0#
10	IOCHRDY	NC	MEMR#	DRQ0
11	AEN	SMEMW#	MEMW#	DACK5#
12	SA19	SMEMR#	SD8	DRQ5
13	SA18	IOW#	SD9	DACK6#
14	SA17	IOR#	SD10	DRQ6
15	SA16	DACK3#	SD11	DACK7#
16	SA15	DRQ3	SD12	DRQ7
17	SA14	DACK1#	SD13	+5V
18	SA13	DRQ1	SD14	MASTER#
19	SA12	REFRESH#	SD15	Ground
20	SA11	SYSCLK	NC	Ground
21	SA10	IRQ7	---	---
22	SA9	IRQ6	---	---
23	SA8	IRQ5	---	---
24	SA7	IRQ4	---	---
25	SA6	IRQ3	---	---
26	SA5	DACK2#	---	---
27	SA4	TC	---	---
28	SA3	BALE	---	---
29	SA2	+5V	---	---
30	SA1	OSC	---	---
31	SA0	Ground	---	---
32	Ground	Ground	---	---



- **PCON 1 : PC/104-Plus Connector**

Pin No.	Description	Pin No.	Description	Pin No.	Description	Pin No.	Description
A1	KEY2	B1	NC	C1	VCC	D1	AD0
A2	VCC	B2	AD2	C2	AD1	D2	VCC
A3	AD5	B3	GND	C3	AD4	D3	AD3
A4	C/BE-0	B4	AD7	C4	GND	D4	AD6
A5	GND	B5	AD9	C5	AD8	D5	GND
A6	AD11	B6	VCC	C6	AD10	D6	M66EN
A7	AD14	B7	AD13	C7	GND	D7	AD12
A8	VCC3	B8	C/BE-1	C8	AD15	D8	VCC3
A9	SERR-	B9	GND	C9	SBO-	D9	PAR
A10	GND	B10	PERR-	C10	VCC3	D10	SDONE
A11	STOP-	B11	VCC3	C11	LOCK-	D11	GND
A12	VCC3	B12	TRDY-	C12	GND	D12	DEVSEL-
A13	FRAME-	B13	GND	C13	IRDY-	D13	VCC3
A14	GND	B14	AD16	C14	VCC3	D14	C/BE-2
A15	AD18	B15	VCC3	C15	AD17	D15	GND
A16	AD21	B16	AD20	C16	GND	D16	AD19
A17	VCC3	B17	AD23	C17	AD22	D17	VCC3
A18	IDSL0	B18	GND	C18	IDSL1	D18	IDSL2
A19	AD24	B19	C/BE-3	C19	VCC	D19	IDSL3
A20	GND	B20	AD26	C20	AD25	D20	GND
A21	AD29	B21	VCC	C21	AD28	D21	AD27
A22	VCC	B22	AD30	C22	GND	D22	AD31
A23	REQ-0	B23	GND	C23	REQ-1	D23	VCC
A24	GND	B24	REQ-2	C24	VCC	D24	GNT-0
A25	GNT-1	B25	VCC	C25	GNT-2	D25	GND
A26	VCC	B26	PCICLK0	C26	GND	D26	PCICLK1
A27	PCICLK2	B27	VCC	C27	PCICLK3	D27	GND
A28	GND	B28	PIRQ-D	C28	VCC	D28	PCIRST-
A29	+12V	B29	PIRQ-A	C29	PIRQ-B	D29	PIRQ-C
A30	-12V	B30	NC	C30	NC	D30	KEY1



CHAPTER 3.

AWARD BIOS SETUP

Award' s ROM BIOS provides a built-in Setup program that allows user to modify the basic system configuration and settings. The modified data will be stored in a battery-backed CMOS RAM so that these data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM stay unchanged unless there is configuration change in the system, such as hard drive replacement or new equipment is installed.

3.1 RUNNING AWARD BIOS

The Setup Utility is stored in the BIOS ROM. When the power of the computer system is turned on, a screen message appears to give you an opportunity to call up the Setup Utility; while the BIOS will enter the Power On Self Test (POST) routines. The POST routines perform various diagnostic checks while initializing the board hardware. If the routines encounter an error during the tests, the error will be reported in either of the two different ways, hear a series of short beeps or see an error message on the screen display. There are two kinds of error: fatal or non-fatal. The system can usually continue to boot up sequence with the non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

" Press <F1> to RESUME "

Write down the message and press the F1 key to continue the bootup sequence. After the POST routines are completed, the following message appears:

" Press DEL to enter SETUP "

Entering Setup

Turn on the power of the computer system and press <Del> immediately. If you don' t have the chance to respond, reset the system by simultaneously typing the <Ctrl>, <Alt> and <Delete> keys, or by pushing the ' Reset ' button on the system cabinet. You can also restart by turning the system OFF then ON.

3.2 CMOS SETUP UTILITY

To access the AWARD BIOS SETUP program, press the <DEL> key. The screen display will appears as :

Main Program Screen

ROM PCI / ISA BIOS (2A69KL7G) CMOS SETUP UTILITY AWARD SOFTWARE, INC.	
STANDARD CMOS SETUP	INTEGRATED PERIPHERALS
BIOS FEATURES SETUP	SUPERVISOR PASSWORD
CHIPSET FEATURES SETUP	USER PASSWORD
POWER MANAGEMENT SETUP	IDE HDD AUTO DETECTION
PNP / PCI CONFIGURATION	HDD LOW LEVEL FORMAT
LOAD BIOS DEFAULTS	SAVE & EXIT SETUP
LOAD SETUP DEFAULTS	EXIT WITHOUT SAVING
ESC : Quit	↑ ↓ → ← : Select Item
F10 : Save & Exit Setup	(Shift) F2 : Change Color
Time, Date, Hard Disk Type....	

This screen provides access to the utility‘ s various functions.

Listed below are explanation of the keys displayed at the bottom of the screen:

<ESC> **:** Exit the utility.

<↑ ↓ → ←> **:** Use arrow keys ↑ ↓ → ← to move cursor to your desired selection.

<F10> **:** Saves all changes made to Setup and exits program.

<Shift> <F2> **:** Changes background and foreground colors.

3.3 STANDARD CMOS SETUP

When you select the "STANDARD CMOS SETUP" on the main program, the screen display will appears as :

Standard CMOS Setup Screen

ROM PCI / ISA BIOS(2A69KL7G)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm : dd : yy) : Tue, Jul 27 1999
Time (hh : mm : ss) : 16 : 29 : 11

HARD DISKS	TYPE	SIZE	CYLS	HEAD	PRECOMP	LANDZ	SECTOR	MODE
Primary Master	: Auto	0	0	0	0	0	0	AUTO
Primary Slave	: Auto	0	0	0	0	0	0	AUTO
Secondary Master	: Auto	0	0	0	0	0	0	AUTO
Secondary Slave	: Auto	0	0	0	0	0	0	AUTO

Drive A : 1.44M, 3.5 in.
Drive B : None

Video : EGA/VGA
Halt On : All Errors

Base Memory	:	640K
Extended Memory	:	64512K
Other Memory	:	384K
Total Memory	:	65536K

ESC : Quit ↑ ↓ → ← : Select Item PU / PD / + / - : Modify
F1 : Help (Shift) F2 : Change Color

The Standard CMOS Setup utility is used to configure the following components such as date, time, hard disk drive, floppy drive, display and memory. Once a field is highlighted, on-line help information is displayed in the left bottom of the Menu screen.

Set Date : Month, Date, Year.

Set Time : Hour, Minute and Second. Use 24-hour clock format (for p.m. time, add 12 to the hour number, you would enter 4:30 p.m. as 16:30). When you select the "STANDARD CMOS SETUP" on the main program, the screen display will appears as:

Hard Disks : There are four hard disks listed: "Primary Master", "Primary Slave", "Secondary Master" and "Secondary Slave". For each IDE channel, the first device is

the "Master" and the second device is "Slave". Hard disk types from 1 to 45 are the standard ones. To select or change the configuration, move the cursor to the desired position and press <Page Up> or <Page Down> to change the option : (1) Press "Auto" for IDE HDD auto detection, (2) Press "User" for user definable, and Press "None" for not installed (e.g. SCSI). There are six categories of information that you must enter for a HDD: "CYLS." for (number of cylinders), "HEADS" for (number of heads), "PRECOMP" for (write pre-compensation), "LANDZ" for (landing zone), "SECTOR" for (number of sectors) and "MODE" for (Normal, LBA, LARGE and AUTO). The hard disk vendor's or system manufacturer's documentation should provide you with the drive specifications. For an IDE hard drive, you can set "TYPE" to "Auto" or use the "IDE HDD AUTO DETECTION" utility in the main program screen to enter the drive specifications.

Here is a brief explanation of drive specifications:

- Type : The BIOS contains a table of pre-defined drive types. Each defined drive type has specified number of cylinders, number of heads, write compensation factor, landing zone, and number of sectors. Drives whose specifications do not accommodate any pre-defined type are classified as type USER.
- Size : Disk drive capacity (approximate). Note that this size is usually slightly greater than the size of a formatted disk given by a diskchecking program.
- Cyls : Number of cylinders.
- Head : Number of heads.
- Precomp : Write precompensation cylinder
- Landz : Landing zone.
- Sector : Number of sectors.
- Mode : Auto, Normal, Large, or LBA.
    - Auto: The BIOS automatically determines the optimal mode.
    - Normal: Maximum number of cylinders, heads, and sectors supported are 1024, 16, and 63.
    - Large: For drives that do not support LBA and have more than 1024 cylinders.
    - LBA (Logical Block Addressing): During drive accesses, the IDE controller transforms that data address described by sector, head, and cylinder number into a physical block address, significantly improving data transfer rates. For drives with greater 1024 cylinders.

The AWARD BIOS supports three HDD modes: NORMAL, LBA and LARGE.

NORMAL mode : This is a Generic Access mode in which neither the BIOS nor the IDE controller will make any transformation during the accession. The maximum HDD size is supported by the NORMAL mode that is 528 Megabytes.

LBA mode : This is a Logical Block Addressing mode which is a HDD accessing method to overcome the 528 Megabytes restriction. The number of cylinders, heads and sectors that are shown in setup may not be the physical number contained in the HDD.
During the HDD accessing, the IDE controller will transform the logical address that is described by the cylinder, head and sector numbers into its own physical address as contained inside the HDD. The maximum HDD size that is supported by the LBA mode is 8.4 Gigabytes.

LARGE mode : Some IDE HDD contains more than 1024 cylinders without the LBA support. This access mode tricks DOS (or other OS) with the number of cylinders that is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside INT13H in order to access to the right HDD address. The maximum HDD size that is supported by the LARGE mode is 1 Gigabytes.

Note : 1. To support LBA or LARGE mode, there are softwares located in the AWARD HD Service Routine"INT13H". It may fail to access a HDD with LBA or LARGE modes selected if you are running under an Operating System that replaces the whole INT13H service routine.
2. Entering incorrect drive specifications will result in a hard disk drive that will function improperly or no function at all.

Drive A and Drive B : Select the correct specifications for the diskette drive(s) installed in the computer.

None	No diskette drive installed
360K, 5.25 in	5-1/4 inch PC-type standard drive; 360 kilobyte capacity
1.2M, 5.25 in	5-1/4 inch AT-type high-density drive; 1.2 megabyte capacity
720K, 3.5in	3 1-2 inch double-sided drive; 720 kilobyte capacity
1.44M, 3.5 in	3 1-2 inch double-sided drive; 1.44 megabyte capacity
2.88M, 3.5 in	3 1-2 inch double-sided drive; 2.88 megabyte capacity

Note : 1. Not Installed could be used as an option for diskless workstations..
2. Highlight the listing after each drive name and select the appropriate entry.

Video : Select the type of primary video subsystem in your computer. The BIOS usually detects the correct video type automatically. The BIOS supports a secondary video subsystem, but you do not select it in Setup.

EGA/VGA	Enhanced Graphics Adapter/Video Graphics Array. For EGA, VGA, SEGA, SVGA or PGA monitor adapters.
CGA 40	Color Graphics Adapter, power up in 40 column mode
CGA 80	Color Graphics Adapter, power up in 80 column mode
MONO	Monochrome adapter, includes high resolution monochrome adapters

Halt On : During the power-on-self-test (POST), the computer stops if the BIOS detects a hardware error. You can tell the BIOS to ignore certain errors POST and continue the boot-up process. These are the selections:

No errors	Whenever the BIOS detects a non-fatal error the system will not be stopped and you will be prompted
All errors	The system boot will be stopped for any error that may be detected.
All, But Keyboard	The system boot will not stop for a keyboard error ; it will stop for all Other errors.
All, But Diskette	The system boot will not stop for a disk error ; it will stop for all other Errors.
All, But Disk/Key	The system boot will not stop for a keyboard or disk error ; it will stop for all other errors.

3.4 BIOS Features Setup

When you select the "BIOS FEATURES SETUP" on the main program, the screen display will appears as:

BIOS Features Setup Screen

ROM PCI / ISA BIOS (2A69KL7G)
BIOS FEATURES SETUP
AWARD SOFTWARE, INC

Virus Warning	: Disabled	Video BIOS Shadow	: Enabled
CPU Internal Cache	: Enabled	C8000 -CBFFF Shadow	: Enabled
External Cache	: Enabled	CC000 -CFFFF Shadow	: Disabled
CPU L2 Cache ECC Checking	: Disabled	D0000 -D3FFF Shadow	: Disabled
Quick Power On Self Test	: Enabled	D4000 -D7FFF Shadow	: Disabled
Boot Sequence	: A,C,SCSI	D8000 -DBFFF Shadow	: Disabled
Swap Floppy Drive	: Disabled	DC000 -DFFFF Shadow	: Disabled
Boot Up Floppy Seek	: Enabled		
Boot Up NumLock Status	: On		
Gate A20 Option	: Fast		
Typematic Rate Setting	: Disabled		
Typematic Rate (Chars Sec.)	: 6		
Typematic Delay (M/Sec)	: 250		
Security Option	: Setup		
PS/2 mouse function control	: Enabled		
PCI/VGA Palette Snoop	: Disabled	ESC : Quit	↑↓→← : Select Item
Assign IRQ For VGA	: Disabled	F1 : Help	PU /PD /+/ - : Modify
OS Select For DRAM >64MB	: Non-OS/2	F5 : Old Values	(Shift) F2 : Color
Report No FDD For WIN 95	: Yes	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

The following explains the options for each of the features as listed in the above menu:

Virus Warning : The default setting of the Virus Warning is "Disabled". When it is enabled, any attempt to write the boot sector and partition table will halt the system and cause a warning message to appear. If this happens, you can use an anti-virus utility on a virus free, bootable floppy diskette to reboot, to clean and to investigate your

system.

CPU Internal Cache : The default setting is "Enabled". This setting enables the CPU internal cache .

External Cache : The default setting is "Enabled". This setting enables the external cache.

CPU L2 Cache ECC Checking : When you select Enabled, memory checking is enable when the external cache contains ECC.

Quick Power On Self Test : The default setting is "Enabled". This speeds up the Power On Self Test (POST) by skipping some items that are normally checked during the full POST. If your system is functioning normally, you can choose this feature to speed the booting process.

Boot Sequence : The default setting is "C:,A:"; the other options are "CDROM, C, A" and "A, C" and "C, CDROM, A". This setting determines where the computer looks first for an operating system, the hard disk, or the floppy disk, …or other. The BIOS will load the operating system from the disk drives in the sequence as selected here.

Swap Floppy Drive : The default setting is "Disabled". This setting gives you an option to swap A and B floppy disks. Normally, the floppy drive A is the one at the end of the cable and drive B is at the other end. If you set this option to "Enabled", the Drive A will function as Drive B, and vice-versa under the DOS.

Boot Up Floppy Seek : The defaults setting is "Disabled". When enabled, the BIOS will check whether there is a floppy disk drive installed.

Boot Up Numlock Status : The default setting is "On". If set "Off", the cursor controls will function on the numeric keypad.

Gate A20 Option : The default setting is "Fast". This is the optimal setting for the CPU card. The other option is "Normal".

Typematic Rate Setting : The default setting is "Disabled". If enabled, you can set the typematic rate and typematic delay.

Typematic Rate (Chars/Sec) : This setting controls the speed at which the system registers the repeated keystrokes. The choices range from 6 to 30 Chars/Sec. The default setting is "6" Chars/Sec.

Typematic Delay (Msec) : This setting controls the time between the display of the first and second characters. There are four delay choices: 250ms, 500ms, 750ms and 1000ms. The default setting is "250" ms.

Security Option : This setting controls the password in the main screen. The options are "Setup" and "System". Select "Setup" and it will protect the Setup Utility settings from being tampered with. Select "System" if you want to use password feature every time the system boots up. The default setting is "Setup". You can create your password by using the "SUPERVISOR/USER PASSWORD" utility on the main program screen.

PS/2 Mouse Function Control : If your system has a PS/2 mouse port and install a serial pointing device, select Disabled.

PCI/VGA Palette Snoop : The default setting is "Disabled". Set to "Enable" if any ISA adapter card installed requires VGA palette snooping.

Assign IRQ for VGA : Select Enabled only if your VGA card requires an assigned IRQ. Most ordinary cards do not; some high-end cards with video capture function do. Consult the information that comes with your VGA card to determine whether it needs an assigned IRQ.

OS Select For DRAM > 64MB : The default setting is "Non-OS2". Set to "OS2" if the system memory size is greater than 64MB and the operating system is OS/2.

Video BIOS Shadow : The default setting is "Enabled" which will copy the VGA display card BIOS into system DRAM to improve performance.

C8000-CBFFF Shadow to DC000-DFFFF Shadow : The default setting for the shadow feature is "Disabled". When enabled, the ROM with the specific address is copied into system DRAM. It will also reduce the size of memory available to the system. After you have made your selection in the BIOS FEATURES SETUP, press the <ESC> key to go back to the main program screen.

3.5 CHIPSET FEATURES SETUP

When you select the "CHIPSET FEATURES SETUP" on the main program, the screen display will appears as:

Chipset Features Setup Screen

ROM PCI / ISA BIOS (2A59IL7G)
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC.

AUTO Configuration	: Enabled	Auto Detect DIMM/PCI Clk	Enabled
EDO DRAM Speed Selection	: 60 ns	Spread Spectrum	Disabled
EDO CASx# MA Wait State	: 2	CPU Host Clock (CPU/PCI)	Default
EDO RASx# Wait State	: 2	CPU Warning Temperature	: Disabled
SDRAM RAS-to-CAS Delay	: 3	Current System Temp.	: 32°C/ 89°F
SDRAM RAS Precharge Time	: 3	Current CPU1 Temp	: 32°C/ 89°F
SDRAM CAS latency Time	: Auto	Current CPUFAN1 Speed	: 0 RPM
SDRAM Precharge Control	: Disabled	Current CPUFAN2 Speed	: 0 RPM
DRAM Data Integrity Mode	: Non-ECC	Vcore : 2.01 V +3.3 V	: 3.31V
System BIOS Cacheable	: Disabled	+ 5 V : 4.94 V +12 V	: 12.09 V
Video BIOS Cacheable	: Disabled		
Video RAM Cacheable	: Disabled		
8 Bit I /O Recovery Time	: 1		
16 Bit I /O Recovery Time	: 1		
Memory Hole At 15M-16M	: Disabled		
Passive Release	: Enabled	ESC : Quit	↑↓→←: Select Item
Delayed Transaction	: Disable	F1 : Help	PU /PD /+/ - : Modify
AGP Aperture Size (MB)	: 64	F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Auto Configuration : The default setting is "Enabled" which will optimize DRAM timing automatically depending on whether the DRAM used is either 70ns or 60ns. The other option is "Disabled" which allows you to change DRAM timing manually.

EDO DRAM Speed Selection : The value in this field must correspond to the speed of the EDO DRAM installed in you system.DO not change the default setting of this field, as determined by the system board manufacturer for the installed DRAM. This vaule is access speed,so a lower value means a fast system.

EDO CAS# MA Wait State : The board designer may select to insert one additional wait state before the assertion of the first CAS# for page hit cycles, thus allowing one additional clock of MA setup time to the CASx# for the leadoff page hit cycle. Do not change from the manufacturer' s default unless you are getting memory addressing errors.

EDO RAS# Wait State : The board designer may elect to insert one additional wait state before RAS# is asserted for row misses, thus allowing one additional MAX{13:} setup time to RAS# assertion. This field applies only if EDO DRAM is installed the system.

SDRAM RAS-to-CAS Delay : This field lets you control the number of DCLKs between a Row Activate command and a read or write command.

SDRAM RAS Precharge Time : The precharge time is the number of cycles it takes for the RAS to accumulate its charge before DRAM refresh. If insufficient time is allowd, refresh may be incomplete and the DRAM may fail to retain data. This field applies only if synchronous DRAM is installed in the system.

SDRAM CAS Latency Time : When synchronous DRAM is installed, you can control the number of CLKs between when the SDRAMs sample a read command and when the controller samples read data from the SDRAMs. Do not reset this field from the default value specified by the system designer.

SDRAM Precharge Control : When Enabled, all CPU cycles to SDRAM result in an All Banks Precharge Command on the SDRAM interface.

DRAM Date Integrity Mode : Select Non-ECC or ECC (error-correcting code), according to the type of installed DRAM.

System BIOS Cacheable : Selecting Enabled allows caching of the system BIOS ROM at F0000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

Video BIOS Cacheable : Selecting Enabled allows caching of the video BIOS ROM at C0000h to C7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

Video RAM Cacheable : Selecting Enabled allows caching of the video memory (RAM) at A0000h to AFFFFh, resulting in better video performance. However, if any program writes to this memory area, a memory access error may result.

8/16 Bit I/O Recovery Time : The I/O recovery mechanism adds bus clock cycles between PCI-originated I/O cycles to the ISA bus. This delay takes place because the PCI bus is so much faster than the ISA bus. These two fields let you add recovery time (in bus clock cycles) for 16-bit and 8-bit I/O.

Memory Hole At 15M-16M : You can reserve this area of system memory for ISA adapter ROM. When this area is reserved, it cannot be cached. The user information of peripherals that need to use this area of system memory usually discusses their memory requirements.

Passive Release : When Enabled, CPU to PCI bus accesses are allows during passive release. Otherwise, the arbiter only accepts another PCI master access to local DRAM.

.

Delayed Transaction : The chipset has an embedded 32-bit posted write buffer to support delay transactions cycles. Select Enable to support compliance with PCI specification version 2.1.

Auto Detect DIMM/PCI Clk : The default setting is "Enabled". To reduce the occurrence of electromagnetic interference (EMI), the BIOS detects the presence or absence of components of DIMM and PCI slots and turns off system clock generator pulses to empty slots.

Spread Spectrum : When the system clock generator pulses, the extreme values of the pulse generate excess EMI. Enabling pulse spectrum spread modulation changes the extreme values from spikes to flat curves, thus reducing EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device

CPU Warning Temperature : Select the combination of lower and upper limits for the CPU temperature. If your computer contains an environmental monitoring system. If the CPU temperature extends beyond either limit, any warning mechanism programmed into your system will be activated.

Current CPU1 Temperature : This field displays the current CPU temperature, if your computer contains an environmental monitoring system.

Current CPUFAN1/CPUFAN2 Speed : This field displays the current speed of the SYS FAN1/CPUFAN2, if your computer contains a monitoring system.

Vcore : This field display the current voltage of input line, if your computer contains a monitoring system

.

After you have made your selections in the CHIPSET FEATURES SETUP, press the <ESC> key to go back to the main program screen.

3.6 POWER MANAGEMENT SETUP

The "Power Management Setup" controls the CPU card' s "Green" features. When you select the "POWER MANAGEMENT SETUP" on the main program, the screen display will appears as:

Power Management Setup Screen

ROM PCI / ISA BIOS (2A69KL7G)
POWER MANAGEMENT SETUP
AWARD SOFTWARE, INC.

Power Management	: User Define	** Reload Global Timer Events **	
PM Control by APM	: Yes	IRQ [3 - 7, 9 - 15], NMI	: Enabled
Video Off Method	: V /H SYNC+ Blank	Primary IDE 0	: Disabled
Video Off After	: Standby	Primary IDE 1	: Disabled
MODEM Use IRQ	: 3	Secondary IDE 0	: Disable
Doze Mode	: Disabled	Secondary IDE 1	: Disable
Standby Mode	: Disabled	Floppy Disk	: Disabled
HDD Power Down	: Disabled	Serial Port	: Enabled
Throttle Duty Cycle	: 62.5%	Parallel Port	: Disabled
PCI / VGA Act-monitor	: Disabled		
PowerOn by Ring	: Disabled		
IRQ 8 Break Suspend	: Disabled		
		ESC : Quit	↑↓→← : Select Item
		F1 : Help	PU /PD/+/- : Modify
		F5 : Old Values	(Shift) F2 : Color
		F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

Power Management : This option allows you to select the type (or degree) of power saving for Doze, Standby and Suspend modes.

Max Saving : Maximum power savings. **Only Available for SL CPUs**. Inactivity period is 1 minute in each mode.

User Define : Set each mode individually. Select time-out periods in the section for each mode.

Min Saving : Minimum power savings. Inactivity period is 1 hour in each mode (except the hard drive).

PM Control by APM : If Advanced Power Management (APM) is installed on your system, selecting Yes gives better power savings.

Video Off Method : Determines the manner in which the monitor is blanked.

V/H SYNC+Blank : System turns off vertical and horizontal synchronization ports and writes blanks to the video buffer.

DPMS Support : Select this option if your monitor supports the Display Power Management Signaling (DPMS) standard of the Video Electronics Standards Association (VESA). Use the software supplied for your video subsystem to select video power management values.

Video Off After : As the system moves from lesser to greater power-saving modes, select the mode in which you want the monitor to blank.

MODEM Use IRQ : Name the interrupt request (IRQ) line assigned to the modem (if any) on your system. Activity of the selected IRQ always awakens the system.

Doze Mode : After the selected period of system inactivity, the CPU clock throttles to small percentage of its duty cycle between 10 percent and 25 percent for most chipsets. All other devices still operate at full speed.

Standby Mode : After the selected period of system inactivity, the CPU clock stops, the hard drive enters an idle state, and the L2 cache enters a power-save mode. All other devices still operate at full speed.

Suspend Mode : After the selected period of system inactivity, the chipset enters a hardware suspend mode, stopping the CPU clock and possibly causing other system devices to enter power management modes.

HDD Power Down : After the selected period of drive inactivity, any system IDE devices compatible with the ATA-2 specification or later power manage themselves, putting themselves into an idle state after the specified timeout and then waking themselves up when accessed.

Throttle Duty Cycle : When the system enters Doze mode, the CPU clock runs only part of the time. You may select the percent of time that the clock runs.

PCI/VGA Act-Monitor : When Enabled, any video activity restarts the global timer for Standby mode.

PowerOn by Ring : When Enabled, an input signal on the serial Ring Indicator (RI) line (in other words, an incoming call on the modem) awakens the system from a soft off state.

IRQ 8 Break Suspend : You can select Enabled or Disabled for monitoring of IRQ8 (the Real Time Clock) so it does not awaken the system from Suspend mode.

Reload Global Timer Events : When Enabled, an event occurring on each device listed below restarts the global time for Standby mode.

IRQ [3-7, 9-15], NMI
Primary IDE 0
Primary IDE 1
Secondary IDE 0
Secondary IDE 1
Floppy Disk
Serial Port
Parallel Port

After you have made your selection in the POWER MANAGEMENT SETUP, press the <ESC> key to go back to the main program screen.

3.7 PNP/PCI CONFIGURATION

Both the ISA and PCI buses on the CPU card use system IRQs & DMAs. You must set up the IRQ and DMA assignments correctly through the PnP/PCI Configuration Setup utility, otherwise the SBC will not work properly.

When you select the "PnP /PCI CONFIGURATION" on the main program, the screen display will appears as:

PnP/PCI Configuration Setup Screen

ROM PCI / ISA BIOS (2A69KL7G)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

PNP OS Installed		: No		Used MEM base addr	: N/A
Resources Controlled By		: Manual			
Reset Configuration Data		: Disabled		Assign IRQ For USB	: Enabled
IRQ-3	assigned to	: Legacy	ISA		
IRQ-4	assigned to	: Legacy	ISA		
IRQ-5	assigned to	: PCI/ISA	PnP		
IRQ-7	assigned to	: Legacy	PnP		
IRQ-9	assigned to	: PCI/ISA	PnP		
IRQ-10	assigned to	: PCI/ISA	ISA		
IRQ-11	assigned to	: PCI/ISA	ISA		
IRQ-12	assigned to	: PCI/ISA	PnP		
IRQ-14	assigned to	: PCI/ISA	PnP		
IRQ-15	assigned to	: PCI/ISA	PnP		
DMA-0	assigned to	: PCI/ISA	PnP		
DMA-1	assigned to	: PCI/ISA	PnP	ESC : Quit	↑↓→← : Select Item
DMA-3	assigned to	: PCI/ISA	PnP	F1 : Help	PU /PD/+/- : Modify
DMA-5	assigned to	: PCI/ISA	PnP	F5 : Old Values	(Shift) F2 : Color
DMA-6	assigned to	: PCI/ISA	PnP	F6 : Load BIOS Defaults	
DMA-7	assigned to	: PCI/ISA	PnP	F7 : Load Setup Defaults	

PNP OS Installed : Select Yes if the system operating environment is Plug-and-Play aware (e.g., Windows 95).

Resources Controlled By : The Plug and Play AwardBIOS can automatically configure all the boot and Plug and Play-compatible devices. If you select Auto, all the interrupt request (IRQ) and DMA assignment fields disappear, as the BIOS automatically assigns them.

Reset Configuration Data : Normally, you leave this field Disabled . Select Enabled to reset Extended System Configuration Data (ESCD) when you exit Setup if you have installed a new add-on and the system reconfiguration has caused such a serious confilct that the operating system cannot boot.

IRQ n Assigned to : When resources are controlled manual, assign each system interrupt as one of the following types, depending on the type of device using the interrupt:
Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific interrupt (such as IRQ4 for serial port 1).
PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

DMA n Assigned to : When resources are controlled manual, assign each system DMA channel as one of the following types, depending on the type of device using the interrupt:
Legacy ISA Devices compliant with the original PC AT bus specification, requiring a specific DMA channel.
PCI/ISA PnP Devices compliant with the Plug and Play standard, whether designed for PCI or ISA bus architecture.

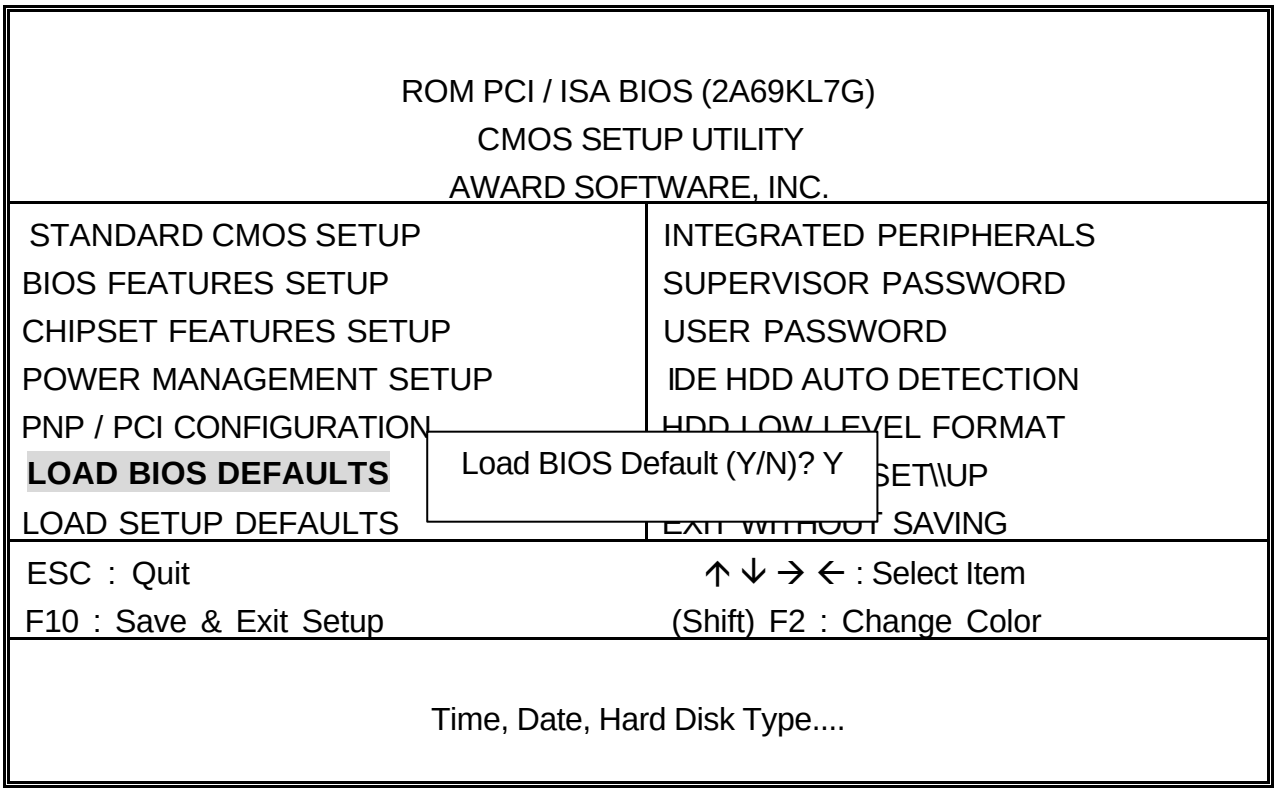
Used MEM base addr : Select a base address for the memory area used by any peripheral that requires high memory.

Assign IRQ For USB : Select Enabled if your system has a USB controller and you have one or more USB devices connected. If you are not using your system USB controller, select Disabled to free the IRQ.

3.8 LOAD BIOS DEFAULTS

The BIOS defaults have been set by the manufacturer which represent settings provided with the minimum requirements for your system to operate. " **Load BIOS Defaults** " loads the troubleshooting default values permanently recorded in the BIOS ROM. These settings are non-optimal and turn off all high performance features.

The Standard CMOS Setup screen is not affected. To use this feature, highlight it on the main screen and press <Enter>. A line will appear asking if you want to load the BIOS default values. Press the <Y> key and the <Enter>. The default settings will load. Press <N> if you do not want to proceed.



3.9 LOAD SETUP DEFAULTS

" LOAD SETUP DEFAULTS" loads the optimal settings which are stored in BIOS ROM. The defaults loaded affect only the BIOS Features Setup, Chipset Features Setup, Power Management Setup, PnP/PCI configuration setup and Integrated Peripherals Setup. There is no effect on the Standard CMOS Setup. To use this feature, highlight the entry on the main screen and press <Enter>. A line will appear on the screen asking if you want to load the Setup default values. Press the <Y> key and then press the <Enter> key if you want to load the Setup defaults. Press <N> if you do not want to proceed.

3.10 INTEGRATED PERIPHERALS

When you select the "INTEGRATED PERIPHERIALS" on the main program, the screen display will appears as:

Integrated Peripheral Setup Screen

ROM PCI / ISA BIOS (2A69KL7G)
INTEGRATED PERIPHERALS
AWARD SOFTWARE, INC.

IDE HDD Block Mode	: Enabled	Onboard Parallel Port	: 378/IRQ7
IDE Primary Master PIO	: Auto	Parallel Port Mode	: SPP
IDE Primary Slave PIO	: Auto		
IDE Primary Master PIO	: Auto		
IDE Primary Slave PIO	: Auto	Onboard Serial Port 3	: 3E8H
IDE Secondary Master UDMA	: Auto	Serial Port 3 Use IRQ	: IRQ10
IDE Secondary Slave UDMA	: Auto	Onboard Serial Port 4	: 2E8H
IDE Secondary Master UDMA	: Auto	Serial Port 4 Use IRQ	: IRQ11
IDE Secondary Slave UDMA	: Auto	Onboard Parallel Port 2	: 278H
On-Chip Primary PCI IDE	: Enabled	Parallel Port 2 Use IRQ	: IRQ9
On-Chip Secondary PCI IDE	: Enabled	Parallel Port 2 Mode	: EPP+SPP
USB Keyboard Support	: Disabled		
KBC input clock	: 8 MHz		
Onboard FDC Controller	: Enabled	ESC : Quit	↑↓→← : Select Item
Onboard Serial Port 1	: 3F8 / IRQ4	F1 : Help	PU /PD/+/- : Modify
Onboard Serial Port 2	: 2F8 / IRQ3	F5 : Old Values	(Shift) F2 : Color
UART Mode Select	: Normal	F6 : Load BIOS Defaults	
		F7 : Load Setup Defaults	

IDE HDD Block Mode : Select Enabled only If your hard drive supports block mode.

IDE (Primary/Secondary Master/Slave) PIO : There are four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

IDE (Primary/Secondary Master/Slave) UMDA : UDMA (Ultra DMA) is a DMA data transfer protocol that utilizes ATA commands and the ATA bus to allow DMA commands to transfer data at a maximum burst rate of 33 MB/s. When you select Auto in the four IDE UDMA fields (for each of up to four IDE devices that the internal PCI IDE interface supports), the system automatically determines the optimal data transfer rate for each IDE device.

On-Chip (Primary/Secondary) PCI IDE : The Intel 82C440BX chipset contains a PCI IDE interface with support for two IDE channels. Select Enabled to activate the primary and/or secondary IDE interface. Select Disabled to deactivate this interface, if you install a primary and/or secondary add-in IDE interface.

USB Keyboard Support : Select Enabled if your system contains a Universal Serial Bus (USB) controller and you have a USB keyboard.

Init Display First : Initialize the AGP video display before initializing any other display devic on the system. Thus the AGP display becomes the primary display.

KBC input clock : The system designer must select the correct frequency for the keyboard controller input clock. Do not change this value from default value.

Onboard FDC Controller : Select Enabled if your system has a floppy disk controller (FDC) installed on the system board and you wish to use it. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field.

Onboard Serial Port 1 / 2: Select a logical COM port address for the first and second serial ports.

UART Mode Select : The UART serial port on your system may offer a variety of infrared port modes. Click here for a description of various modes. (Click your browser' s Back button, or your right mouse button, to return to this page).

Onboard Parallel Port : Select a logical LPT port name and matching address for the physical parallel (printer) port.

Parallel Port Mode: Select an operating mode for the onboard parallel (printer) port. Select Normal, unless your hardware and software require one of the other modes offered in this field.
For information about parallel port modes, see http://www.fapo.com/1284.htm

3.11 SUPERVISOR/USER PASSWORD

The "SUPERVISOR/USER PASSWORD" utility sets the password. The SBC is shipped with the password disabled. If you want to change the password, you must first enter the current password, then at the prompt -- enter your new password. The password is case sensitive, and can be up to 8 alphanumeric characters. Press <Enter> after you have finished typing in the password. At the next prompt, confirm the new password by re-typing it and pressing <Enter> again. When you are done, the screen automatically reverts to the main screen. Remember that when you use this feature, the "Security Option" line in BIOS FEATURES SETUP will determine when entering the password will be required.

To disable the password, press the <Enter> key instead of entering a new password when the "Enter Password" in the dialog box appears. A message will appear confirming that the password is disabled.

If you have set both supervisor and user password, only the supervisor password allows you to enter the BIOS SETUP PROGRAM.

Note : If you forget your password, the only way to solve this problem is to discharge the CMOS memory by turning power off and placing a shunt on the S1 (open pad) for 5 seconds, then removing the shunt.

3.12 IDE HDD Auto Detection

If your system has an IDE hard drive, you can use this utility to detect its parameters and enter them into the Standard CMOS Setup automatically.

If the auto-detected parameters displayed do not match the ones that should used for your hard drive, do not accept them. Press the <N> key to reject the values and enter the correct ones manually on the Standard CMOS Setup screen.

Note : If you are setting up a new hard disk drive (nothing on it) that supports LBA mode, more than one line will appear in the parameter box, choose the line that lists LBA for an LBA drive.

Do not choose Large or Normal if the hard disk drive is already fully formatted when you install it, choose the mode " HDD Low Level Format" to format it.

3.13 HDD LOW LEVEL FORMAT

Select and highlight this option press the <Enter> key to enable you to perform the low level format of hard disk drive.

3.14 SAVE & EXIT SETUP

Select this option and press the <Enter> key to save the new setting information in the CMOS memory and continue with the booting process.

3.15 EXIT WITHOUT SAVING

Select this option and press the <Enter > key to exit the Setup Utility without recording any new values or changing old ones.

CHAPTER 4.

DRIVERS SUPPORT

4.1 DRIVERS OF CD-ROM LIST

The Table list below shows the drivers supported for EM370/B.

Diskette Name	Driver Directory Name
69kdrv	Win31,Win95,Win98 Nt40,JOS2
h-monitor	Win95_98
ess1938	Win 95 Win 98 Nt40
8139	Win 31/95/98/2000,Linux, Nt3.51/4.0

APPENDIX A

HOW TO USE WATCH-DOG TIMER

You can enable the watch-dog when your application software monitors an unexpected or not respond, then the timer generates a reset to reboot your system. During the period of enable to reset, you could still cancel reset by disable the watch-dog. Decision the way you want to set the period for reset by select hardware or software watch-dog (if both of them are available). For hardware setting period, select period by jumper. For software setting period, normally setting hardware watch-dog timer period to 16 sec.

Hardware watch-dog using example

EX.1: For DOS

Execute the **DEBUG.EXE** under DOS, Then key-in **i443**. The system will reboot automatically according to the time-out you set.

Enable	**Disable**
C:\DOS> DEBUG	**C:\DOS>DEBUG**
-i443	**-i43**

EX.2: For assemble Language

Enable :	Disable :
MOV DX, 443H	**IN AL, 43H**
IN AL, DX	

Software watch-dog using example

EX.1: For DOS

Enable	**Disable**
C:\DOS> DEBUG	**C:\DOS>DEBUG**
-o443F	**-o441F**

EX.2: For assemble Language

Enable :	**Disable :**
MOVDX, 443H	**MOV DX, 441H**
MOVAL, 0FH	**MOV AL, 0FH**
OUTDX, AL	**OUT DX, AL**

Note : "F" is the period of software watch-dog timer (normally "F" indicated 0 sec.). 0 to 9 and A to F are used for represent different period. Normally, the step is 2 sec. That means "E" is 2, "D" is 4, "2" is 26, "1" is 28 and "0" is 30 seconds.

APPENDIX B

TECHNICAL REFERENCE

I/O PORT ADDRESS MAP

Address	Function
000 - 01F	DMA Controller #1
020 - 03F	Interrupt Controller #1
040 - 05F	Timer Chip
043	Disable Watch-Dog Times Operation (Read)
060 - 06F	Keyboard Controller
070 - 07F	Read Time Clock/NMI Mask
080 - 09F	DMA Page Register
0A0 - 0BF	Interrupt Controller #2
0C0 - 0DF	DMA Controller #2
0F0 - 0F1	Clear/Reset Math Coprocessor
1F0 - 1F7	Hard Disk Controller
200 - 210	Game Port
278 - 27F	Parallel Port #2
2E8 - 2EF	Serial Port #4 (COM 4)
2F8 - 2FF	Serial Port #2 (COM 2)
300 - 31F	prototype Card/Streaming Tape Adapter
360 - 36F	PC Network
378 - 3FF	Parallel Port #1
380 - 38F	SDLC #2
3A0 - 3AF	SDLC #1
3B0 - 3BF	MDA Video Card (Including LPTO)
3C0 - 3CF	EGA Card
3D0 - 3DF	CGA Card
3E8 - 3EF	Serial Port #3 (COM 3)
3F0 - 3F7	Floppy Disk Controller
3F8 - 3FF	Serial Port #1 (COM 1)
443	Enable Watch-dog Timer Operation (read)

MEMORY ADDRESS MAP

Address Range (Hex)	Description
000000H - 09FFFFH	640 KB of Conventional RAM
0A0000H - 0BFFFFH	128 KB of Video RAM
0C0000H - 0EFFFFH	256 KB of I/O Expansion ROM
0F0000H - 0FFFFFH	64 KB of System BIOS ROM
0100000H - 7FFFFFFFH	1 MB ~ 128MB of User RAM

DMA CHANNELS

CHANNEL	Function
DMA 0	Reserved
DMA 1	Reserved
DMA 2	Floppy Disk Controller
DMA 3	ECP Parallel Port
DMA 4	Cascade for DMA #1
DMA 5	Reserved
DMA 6	Reserved
DMA 7	Reserved

INTERRUPT CONTROLLER

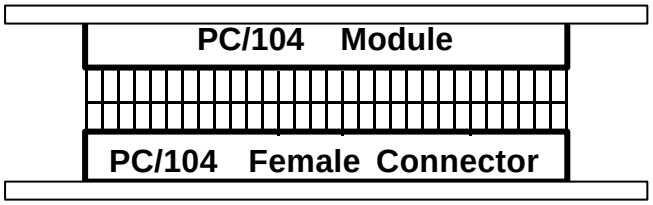
IRQ	Function
IRQ 0	System timer output
IRQ 1	Keyboard
IRQ 2	Cascade for INTC #2
IRQ 3	Serial port #2
IRQ 4	Serial port #1
IRQ 5	Parallel port #2
IRQ 6	Floppy disk controller
IRQ 7	Parallel port #1
IRQ 8	Real time clock
IRQ 9	Software redirected to INT 0AH (IRQ 2)
IRQ 10	Reserved
IRQ 11	Reserved
IRQ 12	PS/2 Mouse
IRQ 13	Math Coprocessor (CPU Internal)
IRQ 14	Primary Hard disk
IRQ 15	Secondary Hard Disk
NMI	Parity Check Error

APPENDIX C

PC/104 MODULE INSTALLATION

There are two steps to install the PC/104 module on EM370 Embedded Single Board Computer.

Step 1. Plug the Dual Side Male Connector into the PC/104 female connector.
Step 2. Plug the PC/104 module‘ s female connector into the EM370 male connector.



Dual-Side Male Connector

EM370 Embedded Single Board Computer

GLOSSARY

8-Bit Bus – Data is transmitted to expansion slots and other components on the bus only along 8 parallel data line.

10Base-T – It is a 10Mbps IEEE 802.3/Ethernet standard that uses unshielded twisted pair cable specification. 10Base-T supports network configuration using the CSMA/CD access method over a twisted pair transmission system up to 100 meters in length without the use of repeater.

16-Bit Bus or ISA Bus – Data is transmitted along either 8 or 16 data lines, depending on what kind of adapter card is used in an expansion slot. ISA is the abbreviation of Industry Standard Architecture.

100Base-TX – It is a 100Mbps IEEE 802.3/Ethernet standard that uses UTP cable. Also called Fast Ethernet, it uses RJ-45 connectors and EIA/TIA T568B pinning. Maximum cable length from hub to node is 100 meters without a repeater.

Adapter – It is also called an expansion board, expansion card, or adapter card. It is a small circuit board that is installed in the expansion slots on the motherboard. You can install a particular adapter that connects a new device such as internal modem, sound card, and scanner.

AGP (Accelerated Graphic Port) – is a 32-bit, 66MHz external frequency data bus that transmit a maximum of 528MB/s of data (4 times the speed of PCI transmission); this design improves the speed of large amount in video transaction.

BIOS (Basic Input /Output System) – This is a chip on the motherboard that contains the instructions for starting up, or booting, the computer, and more.

Bus – Data that travels in a computer along the circuits on the motherboard are called buses. Although three main buses (data bus, address bus, and control bus) manage the computer' s operation, often these are collectively called the bus. The bus carries instructions back and forth between the CPU and other devices in the system. ISA, EISA, VL-Bus, PCI and SCSI are examples of PC buses.

bps – Bits per second. Also often preceded by K (kilo/thousands), **Kbps** – Kilo bytes per second, and M (mega/million), **Mbps** – Mega bytes per second.

Bus Mastering – A method of transferring data through a bus in which the device takes over the bus and directly controls the transfer of data to the computer' s memory. Bus mastering is a method of Direct Memory Access (**DMA**) transfer.

Cache – Cache RAM is an extra holding area for program instructions that need to be frequently used by the CPU or swapped in and out of RAM. Your CPU can usually access those instructions from the cache more quickly than it could from a hard disk or even RAM, so a cache helps the system work more efficiently. Most systems sold today offer either 256K or 512K cache.

CPU (Central Processing Unit) – executes all commands and controls the flow of data, providing the " brain " that enables the PC to calculate and perform the operations like sorting information more quickly than a human could. The CPU makes perhaps the greatest contribution to a PC' s speed and power. Note: Any additional information is subject to change without prior revision from the supplier.

Table 1 -- CPU Speeds

Processor type	Speed ratings (MHz)
486DX2	66, 80
486DX4	75, 100, 120
Pentium	90, 100, 120, 133, 166, 200
Pentium MMX	166, 200, 233
Pentium Pro	166, 180, 200
Pentium II	233, 266, 300, 333

EIDE (Enhanced IDE) – It is a hard drive controller that enables your system to be able to handle fast hard disk drives at a speed of 10Mbps.

EISA or MCA Bus – Data is transmitted along 32 data lines to adapter cards designed specifically to work with the 32-bit buses. MCA expansion slots cannot accept 8-bit or 16-bit adapter cards. EISA stands for Extended Industry Standard Architecture, while MCA stands for MicroChannel Architecture. MCA is architecture used in IBM Microcomputer.

Expansion slots – Expansion slots are plug-in connectors that allow you to insert additional circuit boards that attach to the rest of the PC through special circuitry called the **bus**. By inserting the right circuit board -- usually called an **adapter** or an **expansion card** – you can increase the resolution and the number of colors used by the display, or you can transform your PC into a machine for recording and playing music.

Fast SCSI – The common nomenclature associated with SCSI-2, the second generation of SCSI offering mandatory parity checking improvements over SCSI-1.

IDE (Integrated Drive Electronics) – It was developed from ST-506 type hard drive interface, utilizes BIOS INT 13h hard drive secondary software and supports two hard drives (Master and Slave). Do not need extra software to drive since it is directly initiated in the BIOS. Data transfer rate is 4.1 Mbps. Take note that this interface cannot support other drive like CD-ROM drive.

IEEE (Institute of Electrical and Electronic Engineers) – It is an international professional society that issues its own standard, and is a member of ANSI and ISO. Popular known standards is:

IEEE802.3 – is a physical layer standard for 10Base-T, 100Base-T, Ethernet, and StarLAN.

IEEE802.5 – is a physical layer standard for Token Ring.

IEEE802.11 – is a physical layer standard for Wireless LAN/WAN compatibility.

IEEE802.12 – is a physical layer standard for 100VG AnyLAN.

LAN (Local Area Network) – A data communications network spanning a limited area. It provides communications between three or more computers and peripherals, in most cases using a high-speed media as it' s backbone.

Keyboard – This is a component that comes in direct contact for you with your PC. The mechanism of keyboard converts a key cap' s movement into a signal sent to the computer. The most common key mechanism are " **capacitate** " and " **hard contact** ". Capacitate keyboard has a spring that causes the plastic and the metal plunger to move nearer to two pads that have large plates (plated in tin, nickel, and copper). These pads are connected to the keyboard' s printed circuit board. Hard contact keyboard causes the key cap to collapse a foam rubber dome that presses against a sheet of plastic on the bottom of which is metallic area connected to the rest of the keyboard' s circuit board.

LDCM (LANDesk Client Manager) – With the help of LDCM, PCs that are either stand-alone or on a network can not escape the control of a system administrator. Alerts will be sent to the user if an abnormal condition is encountered in a PC. It allows the administrator to give each PC a thorough check-up. Additionally, this feature is available to multiple OS' s on the market today. LDCM Key Features include the following : ←Health Monitoring , ↑Real-Time Alerting , →Remote Accessibility , ↓Extensive Instrumentation. This is a product from Intel.

Mouse – The keyboard is a barrier to learn how to use a computer. Xerox Corporation first developed the concept of a pointing device, something a computer user could move with his or her hand, causing a corresponding move on screen. Because of its size and tail like cable, the device was named for the mouse. Apple Computer made the mouse a standard feature of its Macintosh computers, and with the popularity of Windows, a mouse is becoming standard equipment on all PCs, as well. The " **Trackball** " have survived more awkward methods of navigating with the keyboard. " **Digitizing tablets** " are popular with architects and engineers who must translate precise movements of a pen into lines on the screen. " Touch screens ", on which you press either your finger and a special light pen to control the software, are too tiring to use for any length of time.

MMX™ – CPU' s with MMX™ technology are optimized to run multimedia application, and therefore, offer faster multimedia playback than standard CPUs. However, when manufacturers introduce any new hardware technology, the software makers need to catch up. At this time of compilation, most applications can' t yet take advantage of MMX™ capabilities.

Parallel port – Parallel ports (labeled **LPT1**, **LPT2**, and so on) are usually for plugging in printers. It is also often called a **Centronics port** – has been almost synonymous with **printer port**. Although a serial port can also be used to send data from a PC to some models of printers, the parallel port is faster. A serial port sends data one bit at a time over a single one-way wire; a parallel port can send several bits of data across eight parallel wires simultaneously. Take note that a serial connection sends a single bit, a parallel port send an entire byte. A parallel connection has one drawback.

PCI Bus (Peripheral Component Interconnect) – It is a connection slot in a motherboard that supports 32-bit bus transfer rates. The now standard PCI Local Bus carries data along at least 32 lines, that is, at least 32 bits at a time. Local bus computer designs add special buses so the CPU can communicate directly with key components like the monitor, resulting in much better performance. You should look for PCI local bus capabilities in any system you buy, especially PCI local bus video (which helps the monitor display more quickly).

POST (Power-On Self-Test) – is the first thing your PC does when you turn it on, and it' s your first warning of trouble with any of the components. When the POST detects an error from the display, memory, keyboard, or other basic components, it produces an error warning in the form of a message on your display and —in case your display is part of the problem —in the form of a series of beeps.

RAM (Random Access Memory) – consists of a bank of chips that act as " working memory ", holding program instructions and data only while your computer' s on. Unless the instructions and data are saved to a disk, RAM forgets them when you turn your computer off. RAM is measured in megabytes (M). Most computers today come with 32M of RAM, though some sell with only 16M installed. There are a few different flavors and speeds of RAM, as well. One of the most prominent today is Extended Data Output (EDO) RAM, but an even faster type of RAM that has just hit the market is called **SyncDRAM**.

Serial port – Serial ports are also sometimes called **COM** (short for COMmunications) ports, and are labeled **COM1**, **COM2**, and so on. It is simple in concept: one line to send data, another line to receive data, and a few other lines to regulate how data is sent over the other two lines – from commonplace modems and printers to plotters and burglar alarms. The most common use for serial port is with a **mouse** or **modem**. The reason for this is that a serial port is not a very efficient way to transfer data, so little data

that speed is not crucial, and perfect for modems because. With current technology, phone lines cannot transport more than one signal at a time anyway. The **serial port** is often referred to as an **RS-232 port**.

SCSI (Small Computer System Interface) – An intelligent bus for transmitting data commands between a variety of devices. There are many implementations of SCSI, including Fast SCSI, Wide SCSI, Fast Wide SCSI, Fast-20, and Fast-40.

SCSI-2 – The second generation of SCSI; includes many improvements to SCSI-1, including Fast SCSI, Wide SCSI, and mandatory parity checking.

SCSI-3 – The third generation of SCSI; introduces Fast-20 and Fast-40 as improvements to the parallel bus. The standard also includes a number of specifications for high-speed serial bus architectures such as SSA, Fiber Channel, and IEEE 1394. Also known as Ultra SCSI.

Ultra SCSI – Also known as SCSI-3, is a third generation SCSI standard that introduced parallel bus speed improvements (FAST-20 and FAST-40), an the miniaturized 68-pin micro connector.

USB (Universal Serial Bus) – USB consolidates serial, parallel, keyboard, mouse, and game ports into one asynchronous and isochronous communications port with bandwidth for data transfer speeds up to 12 Mbps without termination. By daisy-chaining USB hubs, up to 127 I/O devices can be connected to one USB port on the PC. USB is completely plug-and play meaning peripherals can be correctly detected and configured automatically as soon as they are connected.

UTP (Unshielded Twisted Pair) – Twisted pair cable with neither individual nor overall shielding. **Twisted Pair** are two wires twisted together to reduce susceptibility to RF crosswalk.

VGA (Video Graphics Array) – A video adapter that supports 640x480 pixels color resolution. The Windows OS provides medium text & graphics standard.

VL-Bus – It is also known as Local Bus; this is an I/O interface that is directly connected and depended of the system CPU. The VL-Bus is an abbreviation of VESA Local Bus.

Terms and Conditions

Date:1997.10.20

Warranty Policy

1. All products are warranted against defects in materials and workmanship on a period of two years from the date of purchase by the customer.
2. The buyer will bear the return freight charges for goods that are returned for repair within the warranty period whereas manufacturer will bear the other way after repair.
3. The buyer will pay for repair (for the replaced materials plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on " RMA Service " , RMA goods will be returned at the customer expense.
5. The following conditions are excluded from this warranty **:**
   A. Improper or inadequate maintenance by the customer.
   B. Unauthorized modification or misuse.
   C. Operation outside of the environmental specifications for the product.

RMA Service

***1. Request a RMA#* :**

Complete and fax to Supplier the " RMA Request Form" to obtain a RMA number.

2. Shipping:

A. The customer is requested to fill up the problem code as listed . If none of the code is selected, please write the symptom description on the remark.
B. Ship the defective units with freight prepaid.
C. Mark the RMA # clearly on the box.
D. Shipping damage as a result of inadequate packing is the customer' s responsibility.
E. Use the original packing materials whenever possible .

3. All RMA# are valid for 30 days only:

When RMA goods are received after valid RMA# period , the goods will be rejected.

RMA Service Request Form

Date:1997.10.20

When requesting RMA service, please fill out this "RMA Service Request Form". This form needs to be shipped with your returns. Service cannot begin until we have this information.

Company:	Person to contact:
Phone No.	Purchased Date:
Fax No.:	Applied Date:
Return Shipping Address _____	
_____	
***For Supplier only**	**RMA No:**
	Account Sales:

Model No.	Serial No.	Problem Code	Remark
			*This form could be copied for more description

***Problem Code**:

01:D.O.A.
02: Second Time R.M.A.
03: No Screen
04: CMOS Data Lost
05: FDC Fail
06: HDC Fail
07: Bad Slot
08: BIOS Problem
09: Keyboard Controller Fail
10: Cache RMA Problem
11: Memory Socket Bad
12: Hang Up Hardware
13: Hang Up Software
14: Other (Pls. Specify)

Request Party ***Confirmed By Supplier***

Authorized Signatures **Authorized Signatures**